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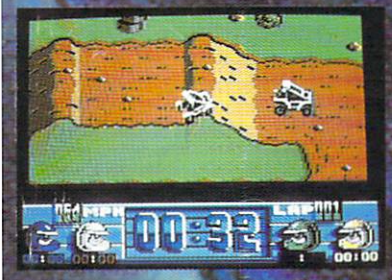

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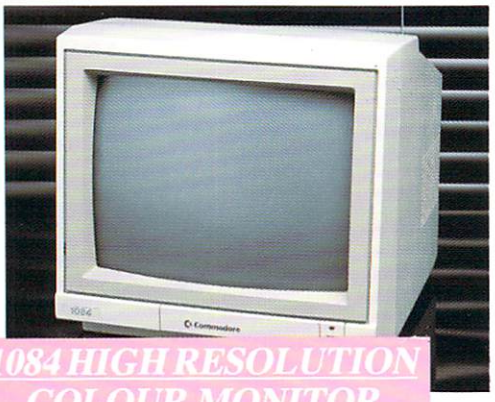

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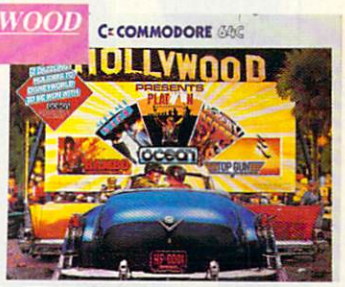

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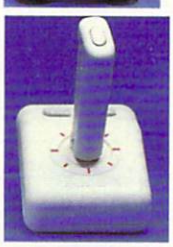

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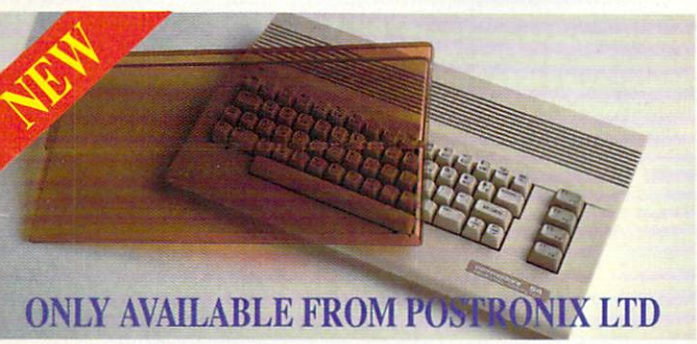

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64 POWER!

CCI View

Dear CCI Reader,

What, somebody asked, was cache memory? Ah yes, said our technical whizz, it's a form of fast memory, which stores up regularly used instructions and executes them at high speed. A nice little enhancement...Like the DOS Extender...

Fortunately, I knew what that was but only by a day or two. The trouble with the computer world is that it changes and grows quite literally daily – possibly for all I know hourly. To keep up with all the changes and the new terms used to describe them would require one's whole time reading and studying. Some ideas seem to be out of date almost before they have any value. For example in the PC field, just when computers using the Intel 386 chip were beginning to be accepted – and well before they have been generally acquired – Intel announces a 486 chip. Will that frighten off buyers from the 386? Bearing in mind, of course, that not everyone has yet bought a 286...Well, I don't know what the 486 will do to the 386 but possibly we will never find out because the word has leaked out the Intel are only a short way off a 586! What is it? No-one (possibly even Intel) knows but it will probably be something like a Cray supercomputer in a desk top machine.

And just this week Intel have launched a 25 megahertz 386 – and the gossip is that a 38 megahertz machine is expected next year. And the 64 runs at just one megahertz. Profusion piled on confusion...

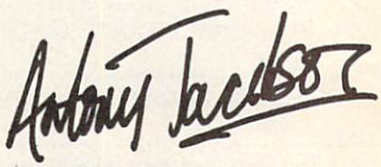
The multimegahertz speeds though do have a reasonably useful purpose for fields like DTP where the computer has to absorb and manage large amounts of information and not leave the operator waiting impatiently for results; and for real time applications especially in graphics like ray tracing which move with painful slowness even on computers like the 68000 Amiga with its almost 8 megahertz.

Yes, speed and memory are foundation stones of the vast and rapid improvements we are daily seeing in computing. They are the glamour areas that first catch the whizz kid eye and percolate down to the rest of us. But there is other progress too taking place. The continual announcement of portables from almost every company who obviously believe that we all move around and need to take our computing power with us. Except Commodore who do not seem interested in a portable Amiga and quickly stopped producing what was practically the first of the portables, the excellent SX64... Commodore as usual first into the market and failing to make it stick.

In addition to the portable computers, we are also beginning to see more portable printers, battery powered. Though whether all these portable electronics will be so popular if the airlines start refusing to allow them onto planes for fear of bombs, I am not so sure.

These constant enhancements and innovations are usually felt first in business where the higher price than existing products that is generally demanded is not a problem. However they do filter down to the rest of the computer-using world with what seems like an ever-decreasing delay. And there are other areas, where technological, especially electronic, advances bring benefits. One of the most encouraging I have read of recently is a computer for the blind. There is no need for monitor or screen. The keys are in Braille and repeat back to the fingers of the operator what would be on the screen for a sighted user. Through those Braille keys, the blind user can both enter and receive information.

Our impatience when we sit in front of a computer screen that takes more than a few tenths of a second to carry out our instructions may be the motivating force for chip companies to offer us great leaps into futuristic electronics; however, in my view the best results of technological progress are in life-enhancing aids such as that Braille computer which genuinely makes a contribution to improving the quality of life of someone who really needs it.



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Managing Editor and Publisher

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VideoCenter

The Commodore Amiga computer has proved popular in Education and with other budget conscious users. G2 System's experience as the U.K. specialist in interfacing computers to video equipment has solved the problem, they tell us, with the VideoCenter.

G2's new VideoCenter combines the facilities of a Video Mixer, Genlocker and PAL Encoder, at an economical price for the serious Amiga user. The G2 VideoCenter mixes an incoming video signal with the computer output, using sliding faders or under PAL Encoder, at an economical price for the serious Amiga user. The G2 VideoCenter mixes an incoming video signal with the computer output, using sliding faders or under software control. It additionally provides a filtered RGB output and has YC inputs and outputs to take full advantage of SVHS systems. The G2 VideoCenter costs under £600.

Contact: G2 Systems, 5 Mead Lane, Farnham, Surrey GU9 7DY. Tel (0252) 737151.

'Active' Staff News

Activision UK Ltd has announced the appointment of Julie Barwick as Consumer Relations Co-Ordinator. Julie's appointment is part of Activision's wish to provide the consumer with an efficient and helpful support service. Julie is there to provide hints and tips on gameplay as well as deal with all general sofwate enquiries.

Julie's latest "brainchild" has been the installation of a recorded message answering machine, (the number is 0734 311003). If this is dialled before 2.00pm there is a chance to hear the latest hints and tips as well as all the news of forthcoming releases. Or alternatively if you have a specific enquiry dial and speak to Julie herself between 2.00pm and 6.00pm.

High "C"

Brown-Wagh Publishing has introduced the Creative Music System which the company describes as a software/hardware combination that can transform any IBM PC or compatible into an orchestra, with you as its conductor.

The company claims that any of the musical scores created with C/MS can be played as a background task on the PC that you can listen, enjoy and relax to your favourite tunes while you do word processing, spreadsheets, or accounting.

C/MS also provides game enthusiasts with stereo sound from the newest entertainment products from companies such as Electronic Arts, Mediagenics, Cinemaware, Epyx, and Sierra.

The system (C/MS), developed by Creative Music Labs (Singapore), consists of a plug-in adaptor card and five disks of software. The card contains 12 channels (voices) of stereo music output with 32 pre-set instruments. It has a built-in stereo amplifier to drive speakers, headphone or home stereos directly. The software includes the intelligent Organ, Composer, Auto-Bass-Chord-Rythm Compiler, Sing-Along, Animator, and over 100 popular songs.

The C/MS Intelligent Organ lets you play a melody on the PC keyboard while it adds the accompaniment. Select desired instruments such as piano, guitar, violin, flute, harmonica, and synthesizer. You can also add rythms such as march, tango, rhumba, swing, samba, rock & roll, disco and waltz. The tempo, key, scale, arpeggio and volume are all switchable from the keyboard real-time. You can listen to the songs already provided, have C/MS teach you how to play them, or create your own masterpieces, using only the PC keyboard. The C/MS Composer lets you use any text editor to compose even more complex musical masterpieces with up to 12 voices (with percussion) in the main theme of the song and let C/MS compile it into a complex musical score.

The C/MS Sing-Along will display the lyrics of a song in synchronisation with the music. It requires an IBM PC or compatible, 256K RAM, and one disk drive. Price: $195. Contact: Brown-Wagh Publishing, 1695 Lark Ave, Suite 10, Los Gatos, California 95030 (U.S.) Tel. (408) 395-3838.

Licence to Kill

007 is back and all set for a stint at cracking the criminal underworld in the thrilling computer version of the mega-movie, Licence to kill.

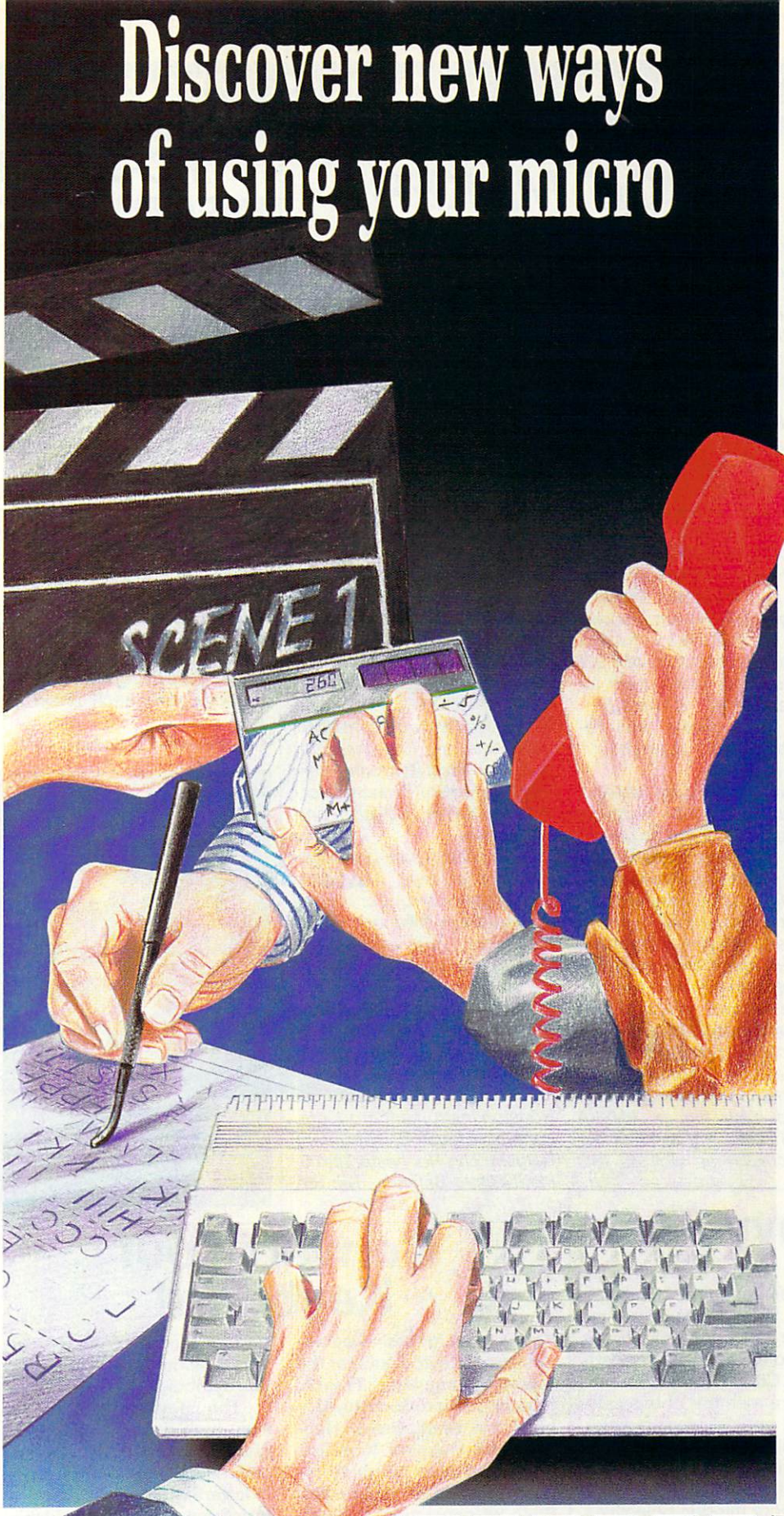
Licence to Kill is the hardest hitting of all the 007 movies yet, Domark tells us, and the computer game reflects the thrills and spills of the film. Timothy Dalton portrays a new, tougher Bond on a personal vendetta against Sanchez. This, the latest Bond movie, pulls no punches as 007 fights his way through a series of hair-raising stunts to destroy arch-drug smuggler Sanchez and the tentacles of his dealer network.

The plot of Licence to Kill, the computer game, closely follows that of the film. In the game you'll have full control of 007 in an exhilarating helicopter chase, a death defying underwater scene dodging sharks and Sanchez' thugs through to the gut churning finale - a race to the border as Bond, in a stolen crop duster, attempts to prevent Sanchez escaping with a massive haul of drugs hidden in a convoy of petrol tankers. Available for C64, IBM compatibles and Amiga.

Magellan Kudos

On February 16, David M Kennedy of Emerald Intelligence Inc. accepted as award from the New Enterprise Forum of Ann Arbor, recognizing MAGELLANTM as Best New Product of 1988. The ward presented annually by the investment group, was one of three presented to "Outstanding Entrepreneurs" in the Ann Arbor area. Congratulations.

Discover new ways of using your micro



Commodore
computer show

Commodore computers are making major inroads into the world of professional and business applications – as you can see for yourself at the Commodore Computer Show. On more than 100 stands you'll find the very latest in desktop publishing software, presentation graphics, desktop video, communications, computer graphics and a whole lot more besides – not forgetting the ever-growing range of innovative entertainment software for when you need to unwind.

With special events, presentations and an advice stand, the Commodore Show is the place to go – whatever your interests.

NOVOTEL EXHIBITION COMPLEX,
HAMMERSMITH, LONDON W6

FRIDAY TO SUNDAY
JUNE 2-4, 1989

10-6pm Friday and Saturday;
10am-4pm Sunday

HOW TO GET THERE
By Underground:
Hammersmith (Piccadilly, Metropolitan & District)
By Bus:
266, 714, 716, 290, 30, 72, 73, 74

Please supply:

☐ Adult tickets at £4 (save £1).....£_____
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IMAGE MAKER

Houston Instrument has announced the HI Image Maker, a new 8 pen DIN A3/A4 size pen plotter designed for both technical and business graphics applications.

The Image Maker is a desktop, flatbed plotter that features Hewlett Packard Graphics Language (HPGL 7475A) emulation, ensuring immediate compatibility with most graphics ad computer aided design packages, including AutoCAD, VersaCAD, Generic CAD, Harvard Graphics, Lotus 1-2-3 and Windows Excel.

It plots at 400 mm/second (15.7 inches sec.) has a mechanical resolution of 0.025 mm (0.0012 inch) and an accuracy of +– 0.1 mm (+– 0.004 inch). Same pen repeatability is +– 0.1 mm (+– 0.004 inch).

The self-capping Hewlett Packard style pens – technical drafting pens or felt tip pens – rest in stalls across the left end of the plotter. As the software calls for a pen change, the plotter automaticall unloads and caps the pen currently in the pen holder, then loads the next chosen pen into the holder on the horizontal slide arm.

The newest addition to the HI family of pen plotters can handle transparent paper, presentation bond paper, and coated clear film in ANSI/A and B sizes (8å" x 11" x 17" respectively) as well as ISO metric sizes A4 (297mm x 210mm) and A3 (297mm x 420mm). The actual plotting area is 7.84" x 10.5" (ANSI/A). 10.24" x 16.38" (ANSI/B). 193mm x 276mm (ISO/A4) and 276mm x 403mm (ISO/A3).

The Image Maker uses either of the two automatically selected interfaces, RS-232-C serial (DB25-pin) or Centronics parallel. The unit automatically switches to the interface that receives the first signal after power-up. Two dip switch panels on the rear of the plotter enable the user to set the RS-232-C communication parameters, select media size and specify the character set. The 14 character set choices include a Katakana font as well as two ASCII character sets and ISO character sets for United Kingdom, German, Swedish, French, Norwegian, Italina, Spanish and Portugese.

The control panel has eight membrane keys, including four directional keys and a pen up/down key for manual pen positioning. This enables the user to, for example, change the plot origin. Using the P1 or P2 keys in combination with the right directional key and Enter key, the user can scale and rotate the plot.

For more information on Houston Instrument products, contact: Houston Instrument Belgium NV, Rochesterlaan 6, 8240 Gistel Belgium. Tel: 32-59-277445, Tlx: 81399.

PC-BASED WORLD INFORMATION PACKAGE

TRIANGLE Publishing Limited, has landed the sole distribution rights for a new US product called PC Globe+.

PC Globe+ is a graphics based statistics and geographical information package from US software house, Comwell Systems.

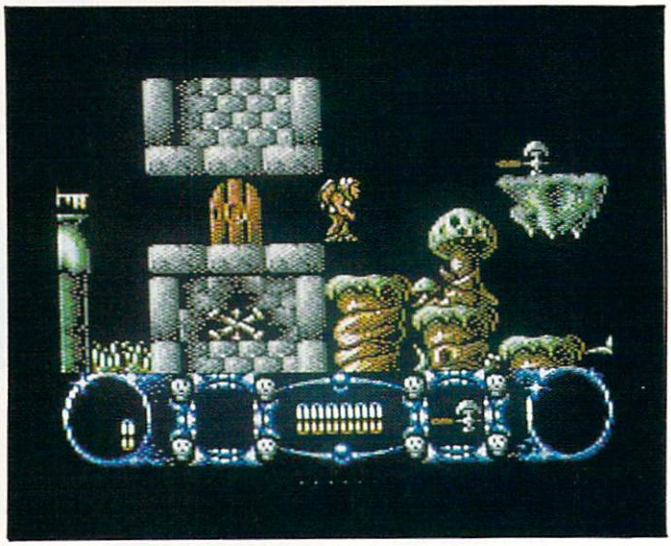
For £69.95, IBM-PC and clone users with either 2 floppy disks or a hard disk will be able to refer to and produce graphs and maps using up-to-date statistical information produced by the United Nations Demographic Yearbook, the World Fact Book from the Central Intelligence Agency and World Development Indications, from the World Bank.

PC Globe+ is distributed by Triangle Publishing on 01-436 5536.

Stormlord

Free the imprisoned fairy folk before they are obliterated by an evil Queen. She stoops to conquer the land Stormlord inhabits, destroying the peaceful euphoria with each annihilation.

Stormlord's mission – free the captured and defend the peace and tranquility of his realm. Ultimately, he must repel the wicked monarch, but should he fail, the evil Queen and her dark sovereignity will reign forever. Available for the Commodore 64. Price: T.B.A.



Navy Seal

NAVY SEAL, a commando game featuring the US Navy's highly trained elite force, the sea-air-land commandos, is soon to be released by Cosmi for the C64.

As a member of this celebrated special warfare force, you will be trained and tested in basic underwater demolition and other skills required to meet your mission objectives. Navigate underwater whilst defending yourself from both marine and human enemies. Perform high-altitude, low-opening (HALO) parachute jumps that enable you to infiltrate unseen into enemy territory. Follow in the footsteps of these special commandos as you meet the challenges of infiltration, demolition, sabotage and reconnaissance.

The game features multiple parallax scrolling, authentic sound effects, multiple scenarios with varying degrees of difficulty and hectic air-sea-land combat action, Microprose UK, the distributors, tell us.

Also included within each copy of NAVY SEAL will be an exclusive Navy Seal digital watch.

Price: £12.95 (disk). Available for C64.

Convert Your Keyboard

Kador now offers specially designed 'Keytop' kits for the following languages: French, Spanish, Italian, German, Arabic, Farsi, Hindi, Greek, Hebrew and Russian (Cyrillic). They can also be custom-made for other languages. Each kit consists of the correct characters, diacritical marks, accents and punctuation symbols.

The 'Keytops' are made from high quality, rigid PVC. They are imprinted on the underside to prevent erosion of lettering. SPecial high performance adhesive keeps the 'Keytops' securely in place. If necessary, they can be removed without damaging the keyboard. For frequent interchanging of keyboard languages, the 'Keytops' can be used on a 'Seal n Type'; the type-through protective keyboard cover. This allows for easy removal and re-use.

Prices for 'Keytops' begin at £17.50. 'Seal n Type' keyboard covers are available for over 150 popular computing keyboards at prices from £7.50.

Contact: Kador, D.M & K.A Young, Unit 4, Pontycynon Industrial Estate, Abercynon, Mid. Glamorgan, CF45 4EP. Tel: 0443 740281.

KICK OFF

KICK OFF is a soccer simulator with emphasis on the accuracy, realism, pace and tactical game play, Anco tell us.

The main features of the game are a full size multi directional scrolling pitch. The scanner shows position of all the players on the pitch. Four distinct tactics including the sweeper formation. Each player on the pitch is an individual with individual skills, a unique combination of four attributes – Pace, Stamina, Accuracy and Aggression. Five skill levels. Skill levels of both teams are set separately, an opportunity for some very interesting games.

The players can dribble, shoot, pass, head and chip the ball and do the sliding tackles. The ball take full account of the air and ground friction. At the higher levels, there is a breeze changing direction randomly. ONE or TWO players option, Practice Skills, Practice Penalties, Play Single game or Play in LEAGUE competition. A league of 8 teams. Load and Save options for unlimited number of leagues. The team names can be edited.

LEASED LINE MODEM MARKETS TO DOUBLE

The global leased line and private line modem markets are forecast to generate more than $2.3 billion in revenues by 1994 representing a two-fold increase over 1984's revenues of $1.3 billion (£800 million).

This strong growth and highlights of other expected development are examined in a new study, "Leased Line Modem Markets, published by Market Intelligence Research Company. The report analyzes the leased line and private line modem markets for 1984–1994 in terms of modems that transmit across telephone wires, fibre optic cable, coaxial cable, and by using radio waves. The largest market segment discussed is modems designed for trans-mission across leased lines provided by telcos.

High-speed leased line modems are experiencing the most growth, with annual revenues approaching one-half billion dollars. This report identifies which modem market is the strongest market segment. Additionally, this study provides a background of the modem industry, including major trends, applications and market factors.

Price: $1495. Contact: MIRC Europe, 55 rue Vandenhoven, 1200 Brussels, Belgium.

Another 'Risc'y venture?

Motorola is now a player in the supercomputer scramble with the launch of its own series of machines, the Delta Series 8000.

The machines based on Motorola's 88100 Risc chip are being promoted by Motorola as a standard for the next generation of Unix machines. Motorola will sell the machines in the US at prices ranging from $28,000 for a single processor multi-user system to $80,000 for a four-processor system. Top-end configurations can handle up to 500 users, the company claims.

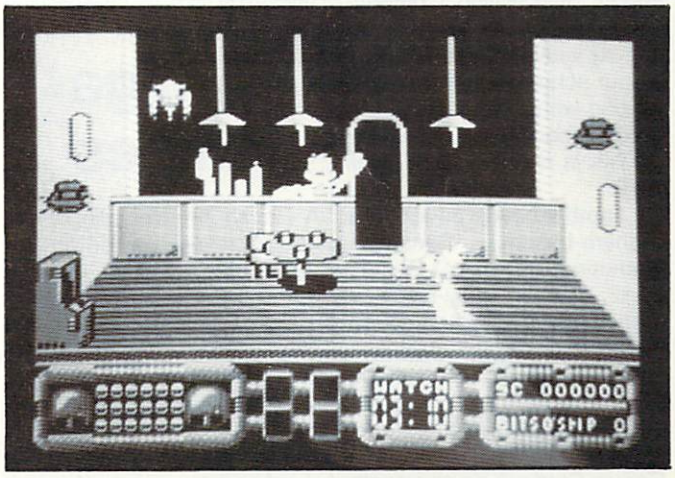
Gilbert Comes to Earth

Gilbert the Alien, star of the TV series Get Fresh and Gilbert's Fridge wants to return to Earth in order to make another TV series, but his fellow Drillians, green and slimy with envy, want to stop him. Now computer games players everywhere, thanks to Again Again and Enigma Variations, can come to Gilbert's rescue.

The game entitled 'Gilbert–Escape from Drill' was produced by new software company Enigma Variations, who are made up of Mark Greenshields and Richard Naylor, and will be marketed by Again Again.

Talk, talk, talk. Rabbit, rabbit, rabbit. Will Gilbert never shut up about his time on Earth? Luckily, even Gilbert has to stop for breath and just asa things are getting back to normal a telly-gram arrives from Earth to invite Gilbert back to do a new series. That's done it. The Drillians can take no more. They decide that the only way to avoid another Winter of Gilbert's bragging is to stop him from getting to the Tyne Tees Television Studios and signing his contract.

The Milleniums Dustbin has certain important parts removed (well wouldn't you class the toilet as important?) and spread about the planet of Drill. The Drillians remain tight lipped about it (not easy when you have a mouth the size of Gilbert's) but, being jolly sporting types, they give him the chance to find some clue as to the whereabouts of the missing pieces. All Drillians love a good video game and so they decide that if Gilbert can beat them at their favourite arcade game they will give him a clue but if he loses then he will have an hour taken off his time.



It all sounds very easy to a being with a brainbox the size of Gilbert's until he realises that he must reach Earth within 24 hours otherwise the contract will be given to another "Superstar".

The missing pieces are spread all over the planet Drill and Gilbert must run, jump, float and swim his way around if he is to succeed. If he manages to find all the missing pieces in time he will be awarded with a new contract from Tyne Tees TV.

Gilbert – Escape from Drill, will be available in mid-April, price C64 £9.99 (C), £14.99 (D), and £19.99 for the Amiga.

WHITE PANTHER SPRINGS

Following the extremely successful launch of INFINITY in March for BBC B/Master, White Panther Publishing have announced the release of 2 new programs.

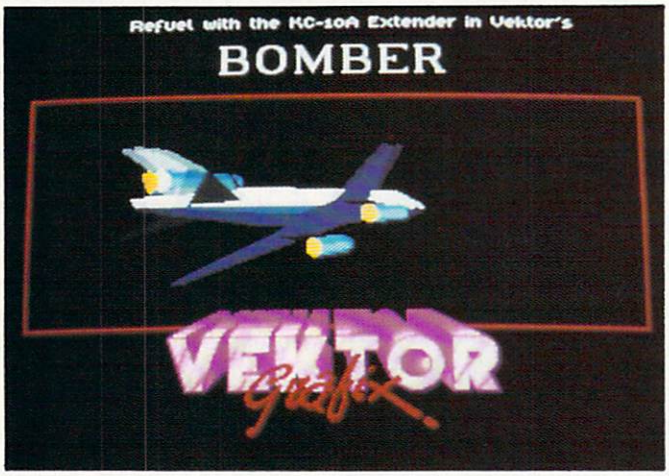
CITY is initially released for IBM/Compatible formats at £29.99. Conversions to other formats are under way and will follow in the summer. CITY is a simulation of the Stock Market and also offers an option to play the International Money Markets. The simulation allows one to four players to trade in shares at various levels of expertise up to Tycoon. Monthly, quarterly and annual results are measured. Taxes, indexes and insurances are applied as well as brokerage costs. Results are analysed and shown graphically.

QUASAR is programmed for the Amiga and will also be released in May on Atari ST format with both versions at £19.99. It makes full use of the Amiga graphic and sound capabilities to present fast moving scrolling arcade action. There are five sectors, each one presenting a different scenario, to pass through; and several modes of weapon, as well as force shields, star bombs and finally the orb.

BOMBER

Nearing completion on six formats following nine months development is BOMBER, a multi-aircraft flight simulator with the accent on action.

The game will feature aircraft as the Tornado IDS (Britain's MRCA front line strike aircraft), the F-4 Phantom, the F-111F Aardvark (the bomber which was used to attack Libya) and uniquely, the Mig-27 Flogger D (the Soviet Block low level attack aircraft).



Whereas most flight simulators concentrate on fighter aircraft, (Interceptor, Falcon, Jet etc.) BOMBER, as the name suggests, is angled towards the interdictor/strike multi-role aeroplane.

So far no confirmed release date has been decided but BOMBER will appear on the Activision label. It's first public showing is likely to be the Summer CES in Chicago.

DYNAMICS

Dynamics Marketing Limited has introduced a new joystick, with an extending connection cable, called the Competition Pro PC. Based on the Company's best-selling Competition Pro 5000, the new unit has an attractive two-tone grey colour scheme and is suitable for use with Amiga and Commodore computers. The RRP of this is set at £15.95 (incl. VAT).

Another new product from Oldham-based Dynamics Marketing is the "A-D Games Card", an easily-installed printed circuit board, designed to interface digital joysticks with computers such as the IBM-PC, AT, XT and compatibles. Featuring twin plugs for 2-joystick operation, the new A-D Games Card will do away with the need to 'fine tune' the joystick as is required with analogue versions.

Price: £24.95 RRP (including VAT). The A-D Games Card also features a switchable slow-motion action facility.

The third new product from the company is more of a package deal, with its components offering a particularly good value deal. The package consists of the new Competition Pro PC Joystick, the A-D Games Card and four top-selling computer games: Wizzball, Tai-Pan, Victory Road and Baseball. Price: RRP £49.95 (incl VAT).

Amiga Slides

A British programming team has achieved a world first by developing software to allow the Amiga to generate colour slides of its computer graphics almost instantly, Burocare Graphics Design tell us:

This breakthrough involves linking the Polaroid Palette - the best-selling slide, print and overhead transparency originator - directly into the back of the Amiga.

Whereas this operation has been attempted before using an interface box, the previous method was not satisfactory because the device drained the signals.

However, this problem has been eliminated by the new "Screenshot" software driver designed by Burocare Graphics Design, the Harrow-based Amiga specialists.

The latest innovative package from Burocare - known as the Polaroid Palette Computer Image Recorder - can produce 12 35mm slides, prints or overhead transparencies in less than half an hour. And that includes exposing, developing and mounting time.

And such is the quality that the end result can be blown up to poster size if required.

The image recorder can also generate batch files, so allowing the system to be left unattended to churn out prints to order.

Working in all modes, this means it can even utilise the Amiga specific HAM (Hold and Modify) facility which offers up to 4,096 colours.

Price: £1,495 (plus VAT), including Amiga interface, Polaroid Palette Image Recorder, Polaroid dedicated 35mm autowind camera back, Polaroid 3 1/4" x 4 1/4" print and overhead projection transparency camera, 35mm Auto Power Processor, illuminated slide cutter/mounter, software and manual. Contact: Burocare Graphics Design Limited, 211 Kenton Road, Harrow, Middlesex HA3 0HD. Tel: 01-907 3636.

Worldwide Bridge Contest

For the fourth successive year, Epson is sponsoring the one-day Worldwide Bridge Contest which, according to Epson, last year attracted over 80,000 players around the world in venues as far apart as Moscow and New York, Melbourne and Reykjavik. The UK alone saw over 8,000 players take part at 286 heats of the Contest.

This year's Contest takes place on Friday 9th June. To attract the public to the game of bridge, and as an encouragement to novice players and social players who have not taken part in a major duplicate bridge contest, in June, Epson are running special "No Fear" heats in British clubs, the company tells us.

The "No Fear" heats will play the same set of bridge hands as in the main duplicate contest but in smaller groups and without the pressure of their scores being fed into the worldwide system.

Evesham Micros

All prices include VAT/delivery

star LC-10
Best-selling CBM ready printer

Now the established market leader in this price category, the LC-10 incorporates many advanced features for such a low price. Its facilities, not normally available in this price range, include 4 NLQ fonts (with 96 combinations) and paper parking (use single sheets without removing tractor paper). Good value 7-colour version also available, which will also accept standard LC10 black ribbons. LC10 available either in '64/128 ready form or as parallel version for Amiga users. Please state your computer type when ordering.

Only £199.00

Colour version also available,

Only £249.00

Prices include two extra black ribbons free of charge

OCEANIC OC-118

NOW WITH NEW 'JIFFY DOS' !

Previously sold as 'Excelerator Plus'

A superb package representing extremely good value for money, combining the Oceanic OC-118 disk drive (previously sold as 'Excelerator+') and the sophisticated GEOS system. Said by COMPUTE's Gazette to have "dramatic improvements over the 1541 in quality and reliability", the drive is a stylish and attractive compact unit featuring a direct drive motor and its own external power supply. GEOS brings the power of a graphic interface and integrated disk turbo to your '64 and includes geoPAINT, a graphic workshop, geoWRITE, a WYSIWIG word processor and many Desk Accessories. Many more extensions available - see below.

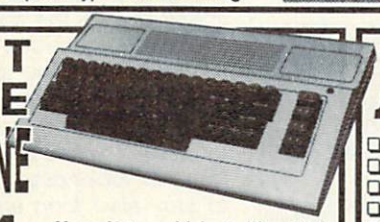
Oceanic OC-118 & GEOS £129.95

Oceanic OC-118 & GEOS plus *Freeze Machine* £149.95

GEOS Applications

GEOS 64 VERSION 2.0	£32.95	GEOPUBLISH 64/128	£32.95
GEOFILE	£24.95	GEOPROGRAMMER	£32.95
GEOCALC	£24.95	GEOS 128 VERSION 2.0	£39.95
DESKPACK+ 64/128	£21.95	GEOWRITE WORKSHOP 128	£32.95
GEOWRITE WORKSHOP	£24.95	GEOCALC 128	£32.95
FONTPACK+ 64/128	£16.95	GEOFILE 128	£32.95
GEOSPELL	£16.95		

GET THE SLIMLINE '64



Your '64 could look like this! Why put up with an old fashioned looking computer? Fit this smart and modern looking new case to your '64 - it will look and feel like you are using a brand new computer. This high quality injection moulded case is simple to fit and gives a lower keyboard height. Reject the old image and order one *now*.

Only £19.95

FREEZE MACHINE for speed, power and ease of use

- Unstoppable Freeze
- Fast save routines
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- Lazer and Turbo fastloads
- Integral reset button
- Tape turbo facilities
- 12 second disk format
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- Selectaload
- many more useful features!

Only £28.95

For speed, power and ease of use it has to be Freeze Machine, probably the most effective backup cartridge on the market! Incorporating two types of fast load routines you can SAVE and reLOAD your favourite games in as little as 10 seconds and no more than 18. Numerous invaluable facilities available, including a built-in reset button. Utility Disc V3.0 also available to complement usage of the cartridge. It allows complete transfer to disk of many tape-based programs that load extra parts, eg. Gunship, Last Ninja, World Games, Supercycle. A very useful add-on.

Utility disc only £7.95

Selected Products

DOUBLER '64 ..... Makes perfect tape backups every time. Consists of hardware and software. Requires access to two data recorders. Very easy to use, only **£12.95**

ICONTROLLER ..... Natty little keyboard mounted cursor controller, ideal for icon-driven applications like GEOS **£11.95**

DATA RECORDER ..... CBM compatible, same as C2N/1531 but cheaper and includes pause control button **£24.95**

DOLPHIN DOS ..... Parallel operating system for use with 64/128 and 1541 disk drive. Fantastic speed increase on LOAD and SAVE whilst maintaining CBM disk format. Many extra DOS & BASIC commands, includes built-in monitor and Centronics printer driver **£69.95**

RENEGADE DISK BACKUP ..... The most powerful on the market today **£19.95**

1541 PHYSICAL EXAM ..... Consists of digital alignment disk and drive fault diagnosis software to check and correct 1541 head alignment. Includes quiet drive stops **£39.95**

1541 QUIET DRIVE STOPS ..... Silences 'knocking' noise with 1541 drives **£4.95**

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AMIGA 500

NEW SPECIAL OFFER AMIGA PACK

Contains Amiga 500, TV modulator, Mouse, Joystick, Mouse Mat, 'Zynaps', 'Purple Saturn Day', 'Hostages', 'Winter Olympiad', 'Quadralien', 'Eliminator', 'Stargoose', 'Backlash', 'Spitting Image' and 1 extra free game (while stocks last) *plus* 5 disks of public domain software !

All this for only £399.00

Amiga 500 system **£359.00**

Philips CM8833 (Colour monitor suitable for Amiga 500) **£229.00**

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Cumana external 5.25" floppy drive 40/80 track 'Transformer' compatible . **£159.95**

Disks & Boxes

25 bulk packed 5.25" DS/DD disks with sleeves, write protect tabs and labels. Good quality and fully guaranteed, only **£13.95**

25 disks + box. Disks as above plus 50 capacity lockable storage box, only **£22.95**

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50 capacity box. Lockable storage unit for 5.25" disks with smoked perspex top **£10.95**

100 capacity box. Larger version **£13.95**

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More Neural Network News

Neural networks, it is claimed, will revolutionise industrial data-processing and ten European companies and research institutes have united in a new project.

ANNIE – the Application of Neural Networks for Industry in Europe – an EC project with the objective to pursue research into the industrial applications of neural networks. The aim of the prospect is to progress further work already carried out in this field by European industry, which lags slightly behind the US.

The UK's Harwell Laboratories has overall responsibility for the project and KPMG will act as co-ordinator. The other participants are IBP-Pietsch GmbH and the Darmstadt Institute of Technology, British Aerospace and Artificial Intelligence from Great Britain, CETIM from France and Alpha and NTU from Greece.

Neural networks differ from conventional technology by processing information in the computer in parallel rather than in series. Their natural model is the human brain and its mode of operation. Initial research in this field was done as early as the nineteen fifties.

This novel mode of data processing could lead to greatly enhanced computer performance. Data resources can be more easily accessed and safeguarded against failure owing to decentralised configuration. Data no longer reside at precisely defined memory addresses, but are stored in intelligent connections – weighted couplings of simple processor elements which can be changed. This allows the computer to modify and augment its 'knowledge' by incoming information during operation.

The main objectives of ANNIE are:

– investigating general applications in industry

– providing a convincing demonstration of the performance of network structures by comparing representative applications with conventional solutions;

– developing software tools.

The total cost of the project will be ECU 5m (approximately DM10.34m). Siemens is investing DM1.8m over a period of three years in ANNIE; some DM900,000 of this come from its own resources, the other half from EC investment aid.

Micronet Commodore Software

Blind Flyer

Get your Biggles garb out, climb into the cockpit and start your first blind flying lesson with this simple but addictive simulator – for C16, PLUS4, C128 in 40 column 128 mode.

Bagel

This is like a double version of Mastermind where rather than just trying to solve a problem set by the computer, you also set a problem for the computer to solve at the same time – for C16, C64, PLUS4 and C128 in 40 column 128 mode.

Basic Tookit 64

A compilation program which adds those keywords which make programming more of a pleasure than a chore. Commands include Adjust, Mem, Send, plus full DOS commands.

Autoboot Maker

For 128 owners who would like to boot their 64 format disk programs. Easy step by step instructions included.

Sprite

A hi-resolution sprite editor to help get your on screen action just right. Whether you want to create munching Pac men or exploding space stations, this editor will make the whole job straightforward.

From Logon Magazine. Telemap Group, Herland Hill, London EC1.

CPU STAND AND VDU/KEYBOARD

Available from Action at £189.00, the Gates PC-Combi-Swinger is a free-standing unit consisting of a vertical computer stand and a fully adjustable support arm for vdu and keyboard, all mounted on a sturdy metal base.

The support arm will carry monitor and keyboard up to a total of 14kg, and the computer stand will accommodate virtually all popular micros.

Contact: Action Computer Supplies, Abercorn Commercial Centre, Manor Farm Road, Wembley, Middx, HA0 1WL. Tel. (0800) 333 333.

Operation Neptune

From the moment his parachute opened and his sea-scooter touched down on the icy waters of the North Pacific, he knew this would be one of his toughest missions ever. Before he could even train his thoughts on the assignments ahead of him, the first attack began; an enemy sea-scooter, similar to his own, appeared as if from nowhere, its rider with one sole aim in mind. Only by careful manouvering and powerful kicks could he hope to stay alive long enough to see his mission begin...

So commences the latest all-action release from Infogrames, the spectacular undersea epic Operation Neptune. With one of the world's most technologically advanced submarines at your disposal, equipped with sophisticated weaponry and transportational devices, it is your assignment to destroy hordes of enemy bases situated on the ocean bed.

Price: Amiga and PC at £24.95; Commodore 64/128 at £9.95 (cass), £14.95 (disk).

Sporting Triangles

CDS Software has acquired the license to produce the computer version of the top rating TV Quiz Show – Sporting Triangles.

Sporting Triangles produced by Central Television for the ITV network, will have its first showing at the forthcoming European Trade Show in April, which will be very near its launch date and the televising of the third Sporting Triangles series.

Sporting Triangles will be available during April 1989 for the following formats, Commodore 64 (£8.99C, £14.99D), and Amiga (£19.99).

Photon Video: EDLP

What, you ask, is EDLP? Some strange new disease? The name of the diner on the corner? No. It is the Photon Video: Edit Decision List Processor (EDLP), recently announced by Microlllusions.

Photon Video: Edit Decision List Processor (EDLP) simplifies a vital step in the creation of professionallyedited video, the company claims. On-line video editing time can be extremely expensive, so a well-prepared edit decision list can save hundreds of dollars!

It works this way: your film or video will be made up of countless bits and pieces taken from several different reels. An edit decision list tells the editing hardware which piece from which reel goes where and when. Creating such a list can be tedious when done by hand, and installing the list in the editing machine manually can create an unnecessarily high fee.

With EDLP, create your own edit decision lists off-line, even at home. Then transfer them to an on-line editing system via the serial port, or via an MS-DOS compatible floppy disk. Once the on-line editing is complete, you can transfer the list back to EDLP for printout and archival storage.

Photon Video EDLP works with 30 frame NTSC (drop-,non-drop and mixed frame modes), 25 frame EBU (PAL) and 24 frame film modes. EDLP supports the CMX, ISC, Convergence, United Media and Grass Valley Group EDL formats.

Photon Video EDLP will be shipping for the Amiga shortly. Price: $499.95.

World Snooker

Steve Davis World Snooker by CDS is a folow up to Steve Davis Snooker.

Steve Davis World Snooker also takes you into the challenging world of Pool and Billiards. You will be able to play against a friend or Steve Davis himself in the UK and American Pool, UK Billiards and Carom (what no pockets!) as well as Snooker.

Steve's skill at snooker, and other baize events, have been programmed into this superb game. Your skills will be put to the ultimate test as you compete against a formidable opponent.

Price: £19.99. Available for the Amiga.

3D Design Disks

ISM announced the release of a series of professionally designed 3D models and components that can be used with Aegis Videoscape 3D and modeler 3D and Byte by Byte's and Sculpt-Animate 3D.

Published by Antic Software of San Franscisco they save time and give professional tools to the Amiga user.

Architectural Design: Creates 3D houses or city designs from the ground up. Includes doors, windows, arches, roofs, walls, stairways and a variety of architectural components.

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Microbot Design: Advanced robotic designs and component parts are featured allowing designs limited only by your imagination. Detailed construction kit to create your own personal robots.

Price: £24.95, Contact: ISM, Grove House, Ventnor Road, Apse Heath, Isle of Wight, PO36 OJT.

Intel takes a new Risc

Intel has announced a 486r chip, the Risc processor codenamed N10, at San Arts on IBM.

The chip is a 64-bit Risc-based devie running at 50Mhz, and includes an on-board 3D graphics unit which will make machines using it much faster than the current generation of CAD/CAM workstations. Although initially the chip, because of its price ($750), is likely to be used in high end machines, ultimately its graphics capabilities will probably be used to produce faster and cleaner windowing interfaces for other machines.

The N10 is not compatible with the 386, while the full 486, due for announcement in the near future, is, as the two new chips have a great deal in common architecturally.

This is not a simulation!

We have heard gruesome tales from the competitive software industry, but none such as this. It seems the Microprose crew and the Electronic Arts team have declared the world to be one huge simulation – and the two companies are now battling for total control!

In woods just off the M42 in London, Microprose took on the "best of Electronic Arts". Armed with simulated guns and rifles (the best kind), the two teams declared war and went into battle against each other.

Both Microprose and EA claimed victory, however, at the end of the day, both weary teams repaired to neutral territory and swapped war stories and compared wounds (so they tell us). The residents at 10 Downing Street and Windsor Castle had no comment.

POSTER MAKER 128

Free Spirit Software has released Poster Maker 128, a poster making package for the Commodore 128 in 128 mode.

Poster Maker 128 allows the user to create large posters ranging in size from 2x2 to 5x5 (25 pages). The posters may be printed out or saved to disk as "Picture" files. Poster Maker 128 includes a graphic utility which permits it to import Basic 8, Sketchpad 128 or Spectrum 128 graphic files. These graphic files can be enlarged on both the x/y axis. Also included is a utility to reduce the size of graphic screens to create clip art.

Poster Maker 128 operates on the Commodore 128D or the Commodore 128 with 64K Video RAM Upgrade in 128 mode with 80 column display. Resolution is 640 x 200 pixel. A 1351 or compatible mouse and a 1571 disk drive are required. Optional support is provided for a 1571 or 1581 disk drive as a second drive.

Price: $29.95 (U.S.) Contact: Free Spirit Software Inc. P.O. Box 128 - 58 Noble St. Kutztown, PA 19530. Tel:(215) 683-5609.

MAGELLAN goes MAC and IBM...

Emerald Intelligence Inc. has announced the conclusion of negotiations with Lotus Development Corporation over the use of the name MAGELLAN. In return for a settlement to Emerald Intelligence, Lotus Development gains the right to market their MAGELLAN product in the IBM and Macintosh markets. Emerald Intelligence will continue to market the MAGELLAN expert system tool under its current name in the Amiga market, and will rename their Macintosh and IBM releases, according to the agreement.

Emerald Intelligence Inc. released the MAGELLAN™ expert system tool in September 1988 on the Commodore Amiga. The rule based tool has received excellent reviews and is priced at $195 (U.S.)

Roll-Out

Roll-Out is the latest arcade action game from E.A.S. for 1 or 2 players. PLayers take the part of little computer men, and the task is to steer the men through over 50 different levels, and battle with your enemies.

Collect objects to gain extra time or points or push stone blocks over the enemies to gain vital extra seconds before a new enemy appears.

Roll-Out is not a simple action game; the player/s must concentrate on solving each level of the game (all with different time limits), and find hidden 'smilies' throughout the game.

It comes complete with sound effects and music, and high score list that saves to disk. Price: C64 £9.99 (cass), £14.99 (disk). Amiga: £19.99.

POPULOUS 'Tuning'

Electronic Arts is pleased to announced that Populous, the original new game from Bullfrog has been further enhanced by a title track from Rob Hubbard, the computer industry's leading music artist. After Hubbard was shown the game he found time to produce a track based on medieval gregorian chanting, which offers an atmospheric introduction to the game.

Hubbard, a freelance music artist for many years and responsible for the music of over 60 computer games, including Sanxion, Monty on the Run and Knucklebusters, left the U.K. in 1988 to work at Electronics Arts U.S. headquarters in San Mateo, California. His work there has concentrated on programming a code package that will allow real soundtracks to be created for entertainment products, supporting half a dozen sound boards currently available for the IBM PC. This approach will let the computer focus on the emotional intent of the music, rather than on the tedium of programming the computer to play music. The driver will be usable over and over again for any product that desires a sound track. His first major product will feature a score with approximately 30 minutes of music.

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DELUXE PAINT III

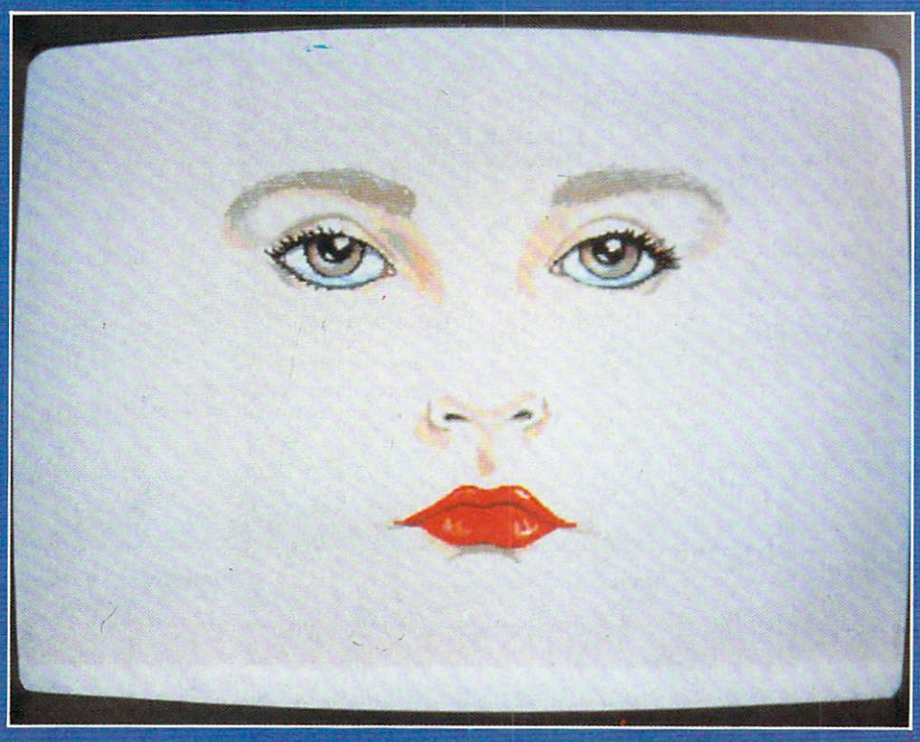
Electronic Arts

Oscar time or Golden Turkey? Film sequels are rarely as entertaining as the original, is this true of software too? Mark Pickavance views Deluxe Paint III from an animators angle

Golden Oldies

For many Amiga owners the first piece of 'serious' software that they used must have been DeluxePaint. Conceived as 'Prism' – an in house graphics editor for Electronic Arts – it first appeared in its current form in November 1985, released as 'Deluxe Paint' for the dynamic new super-micro the AMIGA. This was before most UK developers even had machines!

Not content with what was instant success for Dan Silva, (author of the DeluxePaint series), immediately began to improve and extend the capabilities of his original design concept. In 1986 his efforts resulted in the release of DeluxePaint II, a more rounded and extensive version of the initial software. Within a relatively short space of time it bacame a home and industry standard for graphics editing on the AMIGA, and an Art package by which all others were graded and marked.



Two years have passed since DeluxePaint II and more graphics packages are available for the AMIGA than almost any other micro computer. They mostly attempt to surpass DeluxePaint in either using HAM ('Hold And Modify') or a range of 'unique' features for which the majority of users can rarely see a practical use.

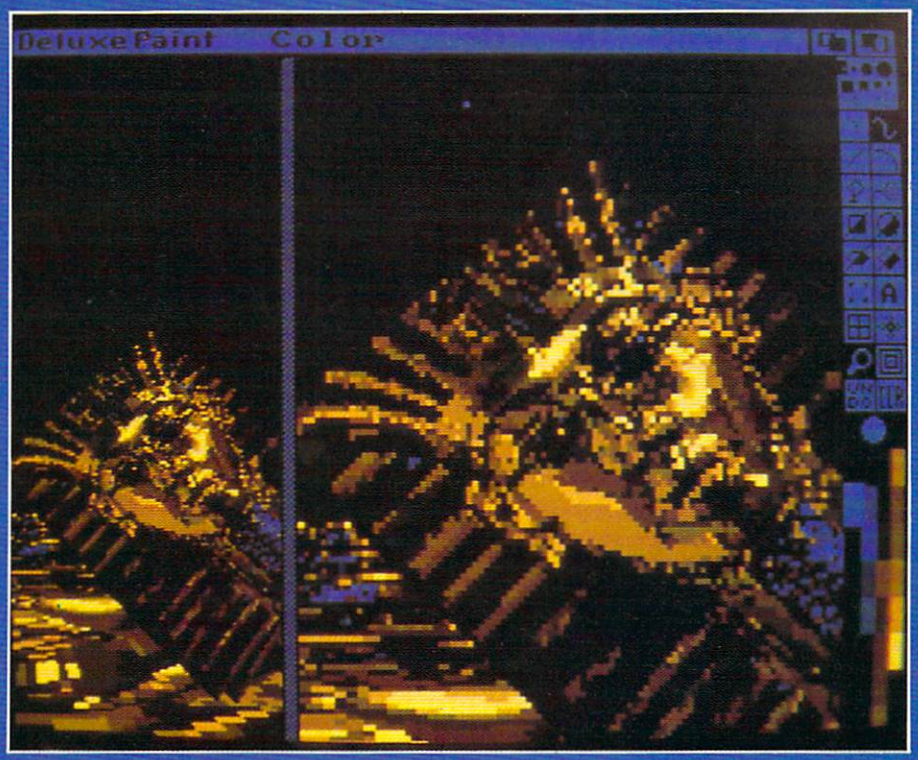
Confidence in his original product has stimulated Dan Silva to continue his work with DeluxePaint, this work has been incorporated into the new, improved, bluepwhite, DeluxePaint III. So is DeluxePaint III ahead of the field, in the way that that both the DeluxePaint I & II were? – and some might say still are. This is not an easy question to answer, but in this and in the next month's issue I will try to give you all the relevant information, plus a few personal opinions regarding the use and successful exploitation of DeluxePaint III.

The Presentation

For the purpose of this review I am going to assume that you are all familiar with DeluxePaint, if you are not then your either not interested in graphics or your fingers have been super-glued to the fire button on your Amiga mouse.

DeluxePaint III comes in a very flash A4 box which contains 3 disks, and an excellent manual of over 240 pages.

Disk one holds DeluxePaint III and the Colour Text program. Disk two is the



'ART' disk; this contains lots of pictures and brushes which demonstrate just how good DeluxePaint is in the right hands. Also on this disk are files which relate to tutorial sections of the manual.

Disk three is the Animation disk and supplies the user with a selection of animation files with which to experiment.

This may seem hyper-critical but, all the screens and animation files were created on American Amigas, and in ther resolution that they run. It would have been gratifying for Electronic Arts to have commisioned some PAL graphics to accompany the UK launch. The files would have taken up more disk space but exploited the machines correctly.

The animation disk contains 4 animations, however only two can be fully loaded and run on my 1 meg Amiga 500. This left me a little disappointed, especially when I saw 5 frames from the suitably entitled 'Cry' (Figure 1). I couldn't see any more because this was all my machine could handle. Those Amiga owners who posess less than a meg are not even going to get that far. At the launch Dan Silva said, "You need at least a meg, two is nice, four is O.K., and eight isn't bad". Need I say more. The documentation assumes no previous knowledge, so first time users need not worry thst they must master previous DeluxePaint's before tackling this one.

The facilities of DeluxePaint II were comprehensive – to say the least – so what extra features are now on offer?

Technicolour or Extra Halfbrite?

The display mode known as 'Extra Halfbrite' is now supported, and some additional features are included specifically for its use. This mode can be used in low-res only but gives 64 colours – these are the standard 32 colours plus the same 32 colours at half their brightness. If used with a little forethought this can make a big difference to the quality of low-res images. If you wish to experiment with this mode I suggest you take a favourite 32 colour picture and add shadows using the extra 32 shades.

This is made very easy by using te new halfbrite option on the MODE menu, enabling you to use a brush to either lighten or darken the picture – depending on which mouse button you press.

Not all AMIGA's support this mode (thanks to Commodore), some of the early AMIGA 1000's need a chip replacement, so I would contact your dealer if the second 32 colours bear an uncanny resemblance to your first 32.

Big Screen Entertainment

You may have recently noticed several AMIGA games which do not have screen borders (PACMANIA and SPACE HARRIER) are good examples). This is another special display mode called 'OVERSCAN'. The technique does not expand the existing display but actually increases the resolution to account for the borders. A typical low-res, PAL 'Overscan' graphics has a resolution of around 352 x 282, which enables you to paint off the edge of the monitor top and sides. This feature can be used in medium and Hi-res but you must remember that you do not get this extra resolution for nothing, it all takes up extra memory.

If you were forced to edit the graphic on the edge of the display you might become very frustrated and mioss pixels not shown on your screen but clearly visible on others. This is neatly circumvented by using the Ctrl and cursor keys to pan the display around the screen (a similar feature to that in preferences).

A Brush with the Stars

In addition to the halfbrite brush mode mentioned above you now have the option to tint. This uses your existing palette to best effect by replacing the hue and saturation levels of the brushed colour with the selected colour. The process

continued on page 38

continued from page 35

calculates the correct RGB (red, green, blue) values and matches them to the nearest colour in your existing palette range. How well this works wil be very much dependent on the number of colours you have and how you have defined them. Although not exclusive to extra halfbrite this feature makes best use of this mode.

Both tint and halfbrite are also included as two of the four new fill modes. The others are Brush and Wrap. This enables the screen to be filled with brushes (even perspective ones) and any shape to be mapped onto any other. The results of the last feature can be described as ranging from bizarre to the very weird.

'Gorillas in a twist' is a landscape created from wrapped versions of a Gorilla picture supplied on the art disk.

Walk on Parts

The list of tiny changes to DeluxePaint III are almost too many to mention here, but here goes:

The continuous freehand tool is now divided into the continuous freehand tool and the filled freehand tool.

Filled and outlined shapes can be selected by holding down the Alt key while selecting the shape tool.

Printer controls have been improved.

The entire svreen can be flipped without making it into a brush.

Info is now more informative.

Any brush can be outlined or trimmed by one pixel, from a menu or with a key press.

When using a brush the 'handle' may be repositioned to any corner of the brush.

With an additional program you can now load and use colour fonts.

The stencil feature has been extended to brush pickups – which means you pickup only the colours you want to.

You do not have to cut brushes from background colour to get a transparent surround – Autotransp will assume any solid colour under your brush is to be treated as transparent.

And finally a great many standard features have been improved by being re-coded in assembler (they were originally in 'C').

The general impression of DeluxePAint III is of speed when compared with its predecessors.

Leading Light

All the new features are overshadowed by one major addition, that of ANIMATION. Their are a great many animation and graphics presentation packages available for the the AMIGA – so what makes DeluxePaint III any better or special?

Firstly, the technique employed, which I describe in some detail later and secondly, the fact that it is integrated with all other Dpaint features. This makes – potentially – a very powerful system for producing animation. The obvious usage is for video and presentation, but many games houses might also find time to develop game animations usng this software.

The animation system functions in two modes: Compressed and Uncompressed. They have different memory requirements, if you use the Uncompressed mode then don't expect to get more than 10 frames of animation in a single meg machine (low-res, 32 colours). In the compressed mode the situation is less exact in terms of how many frames you can have, it is very much dependent as to how much is happening on-screen. Example: You create a red and white checkerboard with which you fill the entire screen. Picking it up as a brush you go to successive frames and paste down the brush with a one pixel offset to create a scrolling background. The squares were 32 pixels wide so you create a repeating cycle in 31 frames.

This animation should take up 40k X 31 frames which is about 1.3 megabytes. It doesn't. Each frame is only stored as the changes from the frame before it. The whole 40k of the first frame is stored and then only the data necessary to change it into frame 2, 3, 4 etc. The end result is that when I tried the above example it took up only 180k, which is quite fortunate for me because of my one meg to play with.

The whole animation process of DeluxePaint III is a memory trade off. You have a choice, lots of colours and resolution or a great many frames of animation – but not both. This is not as big a drawback as it might first seem, once you get to know the limitations of your memory setup you can tailor your objectives (and expectations) to suit the enviroment.

The features which are unique to DeluxePaint III are the Move requestor and the facility known as Animpainting.

The Move requestor is the heart of the animation system. In this brushes can be made to perform an imaginable movement. You have control over all three planes of motion and can be set over how many frames your action will take place. The 'Tut' animation shows what is possible. When used in conjunction with the 'perspective' effects this can create some stunning special effects.

If you are more creative – or not so lazy – then animpainting is for you. This is a curious option which makes producing animation very easy and quick. If you wish to 'hand' animate an object as it traverses the screen then by holding down the left Amiga key the frames will auto-flip as you paint. The result achieved with this feature are more natural than those generated with the move requestor. Animpainting can also be done with the strange creatures called animbrushes.

M.P.

Contact: Electronic Arts, Langley Business Centre, 11-49 Station Road, Langley, Nr.Slough, Berkshire SL3 8YN. Tel:(0753) 46465.

Price: £79.95
Upgrade Policy: Deluxepaint I £50 and £5 carriage. DeluxePaint II £30 and £5 carriage.

DECISION MAKER

There once was a time when I used to be undecisive, but now I'm not so sure! Sorry, that was supposed to be a joke. (and it's a *very* old one, Ed.) seriously though, here is another excellent package from Collins Soft, one more application from their Brainpower series, to make your beloved C64 do all the complex work for you. This time you have a chance to completely change your lifestyle. It is decisions that have put us in the position we are all in today. I know that some decisions other people make will sometimes affect us indirectly, but we have no control over these. The other 99% of all decisions we have to make in our life are made either by asking someone who has more experience than ourselves or by taking a rather educated guess. The Decision Maker will take all the guesswork out of the problems you may encounter enabling you to make the right decision at the right time.

The package, like all the others in the Brainpower series, can either be disk or tape based, and comes complete with a stand up text book. The two sided disk version has the tutorial program set out one one side and the application programs on the other.

The techniques presented in the program can be used to perform an explicit analysis of a particular situation, and reveal the appropriate strategy to adopt. Your role as a decision maker is simplified because you can see how various actions taken now genrate different outcomes in the future.

This structuring of the decision making progress is called decision analysis. You can look at a problem, break it down into sequential compnent parts, and this process will lead you to a more enlightened view of the options, allowing you to take greater control over the pattern of future events. In the words of the song "Que sera sera, whatever will be will be, the future's not ours to see, que sera sera."...well the future is yours to see by studying the teaching program. You'll soon be able to see what the future can hold if you can make certain decisions at certain times.

The applications program is a powerful tool for anyone interested in strategy and decisions in all walks of life who want to minimise the risks involved. I can think of quite a few politicians whom this program seems to be the perfect solution to their decision making problems. I wonder what the world would be like today if Hitler hadn't decided to go and invade Poland, or if Maggie Thatcher had decided to work at the checkout in her Dad's grocers shop, or what if God decided not to create Eve? It makes you think doesn't it?

For the beginner, this program teaches you what kind of problems can be solved by decision analysis and how this process is applied. It is important to appreciate that not all decision making problems can be easily resolved by this method. Other methods are necessary such as Critical Path Analysis, this topic was discussed in last month's issue, with the review of Project Planner another Brainpower program. To use decision analysis, it must be possible to break the problem down into a finite number of elements in the following way;

1) There is an initial decision to make, and there is a limited number of clearly defined alternatives from which to choose.
2) For each decision, there is a limited number of possible alternative outcomes.
3) Each outcome could lead to another decision with another series of possible alternative outcomes, and so on.

The technique of analysing the decision involves drawing a diagram of the process in a symbolic form. This is called a "Decision Tree" and will help to make a very complex decision look somewhat simpler. Once the problem has been disected in this way, we need a means of judging the value of the decision. In business, this usually gets measured by the cost or profit, but in other circumstances the value could be assessed in the number of lives saved, or the number of jobs created or some other non-cash figure. You must be able to estimate the "value" of each decision and its outcome so that the initial decision which leads to the highest value can be selected.

The application of Decision Maker techniques to a wide range of situations is a powerful management tool for a number of reasons. It compels you to recognise the structure and relationships between the various elements involved. It makes you evaluate all the possible actions and outcomes. It will also make you study and maybe modify the costs, values and risks of the different activities involved and test them to find out how much things need to change to make you alter your final decision.

Second Hand Cars

Here is a simple example of the program at work. Problems, such as buying a second hand car, are very common so making a decision whether to buy from a garage or privately should explain how Decision Maker and your C64 can work out the best possible course of action. Let's say you want to buy a six year old Ford Escort. Assuming that there is a choice of one on a garge forecourt and one identical car for sale privately, let's look at the decision of which one to buy. The car at the garage will cost $1000 with a 6 months guarantee, if it breaks down the garage will put it right for you. The private car will only cost $600 but with no guarantee. if it breaks down you'll have to pay to get it mended or try to sell and recover some of your money. You must make a decision tree such as the one here.

1) You buy the guaranteed car and don't have to worry if it breaks down. 2) You could buy the cheap car which turns out to go well and there is nothing to worry about. 3) The cheap car breaks down and repairs cost a lot of money. 4) It breaks down and the repair was not too costly. 5) It breaks down and we sell it for a profit, putting the money towards buying the guaranteed car, or finally. 6) It breaks down and we lose money on selling it and we then buy the guaranteed car.

These alternatives each have a value which you must estimate, all these costs can then be added to your decision tree. This is only part of the whole problem, however, you have worked out the probable events, but not the probability of the events taking place. You could estimate that there is a 70% chance that the six year old car will break down in the first six months therefore it has a 30% chance of not breaking down. Then you estimate the cost of the repairs, say 60% chance of highg repair bills and 40% chance of low bills.

When you weigh up the probabilities and possibilities of each eventuality along with your estiamted costs you'll find that the decision to buy the private car was probably the right one. Estimated saving by buying the private car would be approxiamately $148.

So the decision to buy the cheap car, balanced aginst selling it again if it breaks down, sounds like a reasonable outcome to me. You must now make a decision whether or not to buy Decision Maker. I will recommend it to all who find making a decision difficult. ***B.C.***

Contact: Collins Soft, 8 Grafton St., London W1E 7JZ. Price: £19.95 (cass), £24.95 (disc).

Feature

Back To Commodore Basics Part I

Peter Gerrard begins an exciting new series on how to develop your own programs using Basic

This series of articles is designed to teach Commodore Basic to the point where you will be able to develop your own programs in this particular variation of a popular computer language. Over the duration of this series we will be building up a variety of programs, and at the end of each article there will be some work for you to do at home which will relate to these programs. Naturally, this work will be explained in full in the following article, and if your sub-program and mine do not correspond, then that doesn't really matter. The important thing is that your sub-program works, and that you understand why it works. If you don't *want* to learn you never *will* learn, so with all that in mind we will begin by examining what is perhaps the most important principle to grasp when starting to program: the principle of line numbers.

Line numbers are essential. Without them the computer will not know the order in which to carry out your instructions. A line is a set of instructions, the number determines its place in the great scheme of things, and that number can be anything between 0 and 65534. You might think it logical that a program would start with line 1, carry on to line 2, proceed thence to line 3, and so on. However, supposing you wanted to amend your program and insert a line 2.5? This cannot be done, so instead it makes more sense to start with line 10, carry on to line 20, and proceed thence to line 30. A line 25 can then be inserted if required. Unless you tell it otherwise, the computer will obey your instructions in strict numerical order. Line 10 comes first, line 20 comes next, and so on.

The computer will try and perform everything we tell it, but sometimes we may come back to a program that was written six months ago and not have the faintest idea about what was going on. This is where the Basic keyword (literally one of the key words in the Basic language) REM comes into play. REM is short for REMark, and we could have a line in a typical program that looked like this:

```
280 REM put up screen display
```

The computer ignores these remarks, but they are a useful aide memoire for the programmer. We know now that the set of instructions following on from line 280 will, as the REMark tells us, put up the screen display (display something on the screen, in other words).

In order to do this we sometimes have to make use of what are termed variables. If we look at the computer instruction (or statement) x=25, this might not make a lot of sense at first. What is x? In this case it is what is known as a numeric variable; we're using numbers. We could then have something like x=x+1, which, mathematically speaking, is nonsense. To the computer, it means take our variable x, add one to it, and store the new value in that same variable x. If we stick to our example, x did equal 25, now it would equal 26. If we wanted x to equal 25 again, we would use x=x−1, and to the computer this would mean take the variable x subtract 1, and place the result *back* in x. Numeric variables, then, are for use in mathematical operations. We can add or subtract, as shown, or multiply and divide, using the symbols '*' and '/' respectively. For example, if we start with x=25, then x=x/5 would place the new value of 5 in the variable x, and if we followed this with x=x*5 then x would once more have the value 25 in it.

The name of the variable can be quite long, although Commodore Basic only recognises the first two letters of the name. Thus, as far as the 64 is concerned, the variables FROD and FRODA would be the same. Also, when choosing your names you must remember that Basic keywords are not allowed. Hence you couldn't have a variable REMARK=1, as it contains the keyword REM.

There is one other important type of variable that we will consider, and this is known as a string variable. Numeric variables deal with numbers, string variables deal with ... pieces of string? Well, in a sense! A string, to the computer, is a piece of text. "FRED" for example. String variables are denoted by use of the dollar symbol, or $, so that we could say something like names$="FRED" if we so wished.

A major difference now arises between string variables and numeric variables, and for this we must consider the Basic keyword PRINT. In Commodore Basic, typing directly onto the screen the letters PRINT "FRED", followed by pressing the RETURN key which tells the computer that we've finished typing in our instruction would result in the word FRED appearing on the screen.

If we had names$="FRED" then the instruction PRINT name$ would also result in the word FRED being printed on the screen. Assuming that our variable x still equals 25, then the instruction PRINT x would see, not a letter x, but the number 25 being printed. Now then, what about PRINT x+x? The answer is that the number 50 appears; the two numbers have been added together, although the value of

Back To Commodore Basics

x remains the same. If we were to PRINT name$+name$, what would we get? Strings cannot be added together like numbers, so the result here would be FREDFRED. This is termed string concatenation.

It is important to distinguish between these two types of variables. Try entering the following series of instructions and study what appears on the screen; don't forget to press RETURN after each line!

```
X=25
NAME$="FRED"
PRINT X
PRINT 25
PRINT X+X
PRINT NAME$
PRINT HELLO
PRINT NAME$+NAME$
PRINT "HELLO"
```

Note especially that PRINT HELLO results in the value of 0 being printed. This is because the computer thinks that HELLO is a numeric variable. PRINT "HELLO" works, because the quotation marks denote that this is now a string.

There is a lot more to strings than this, however, and before we can write the next line of our program (line 280, the REMark statement, is the first line of this month's sub-program) we must consider two new commands. These are CHR$ and ASC. Everything that we have been printing on the screen belongs to what is known as the ASCII character set, ASCII being short for the American Standard Code for Information Interchange. One man's standard is another man's quirk, and I often think that no two makes of computer use the same "Standard Code". We shall, of course, stick to the Commodore Basic standard as used on the 64.

The keyword CHR$ has a dollar sign on the end, so that tells us that we're dealing with a string of some sort. There are in fact 255 pre-determined strings on the 64, 255 characters that can be printed. Not all of them can be printed on the screen, though, as some of them perform actions as well as being strings. Try entering PRINT CHR$(147) and you'll see what I mean. PRINT CHR$(65) produces something a mite more intelligible, and having done that try PRINT CHR$(66) as well: you'll notice a trend developing.

Some of these CHR$ numbers, or character strings, produce graphic symbols that we can print on the screen and use for designing images. In this first sub-program we're going to be printing a box on the screen, and filling it with information for the user of the program. Designing a program menu, in other words. We will be unable to act on the information, that comes next month, so for now we will just concentrate on getting the box looking as it should.

ASC is the opposite of CHR$, and as it doesn't have a dollar sign at the end you can tell that we are dealing with numeric variables. If we have A$="A", try PRINT ASC(A$) to see what happens. As you will see, we have turned a string into a number, and this will be of great use next month. As ASC and CHR$ are so closely related, it has been included here, but we will hear no more of it for another month or so.

A couple of paragraphs ago I mentioned PRINT CHR$(65) and PRINT CHR$(66). What if we wanted to print all 26 letters of the alphabet? It would be a mite tedious printing out every single one individually, but fortunately Commodore Basic comes to the rescue. If we want to repeat one or more commands FOR a specific number of times we use something like the following:

```
FOR I=1 TO 26:PRINT CHR$(64+I);:
NEXT I
```

Enter that line now, and see what happens. Type it in exactly as shown. That semi-colon after the print statement means "don't go onto the next line when you've printed something, but print it directly after instead". Leaving it out would result in a long list of letters being printed one underneath the other, we want them all on the same line.

The FOR statement tells us that we are going to be repeating a series of instructions. The I=1 TO 26 informs the computer that there will be 26 "repeats", where I is a simple numeric variable. When we come to the PRINT CHR$(64)+I);: part, this instructs the computer to print out the character string corrospending to CHR$(64+I), so when we first come to this I will have the value of 1, and CHR$(64+I), or CHR$(65), is printed out. Then we take the NEXT value of I, which is 2, so CHR$(64+2), or CHR$(66), appears. And so on, until I equals 26 and we get CHR$(64+26), or CHR$(90), being displayed on the screen.

Note the colons to separate instructions. This is the first time we've met them, and they become invaluable when writing a line of a program, enabling us to get more than one instruction on each line.

We mentioned graphics characters earlier, so try entering the following:

```
FOR I=170 TO 191:PRINT CHRS$
(I);I:NEXT I
```

Again, note the colons and semi-colons where appropriate. What we get now is a series of graphics characters appearing on the screen, and as we have instructed the computer to print the value of I next to them, we can see which character string does what. CHR$(176), for instance, would make a good left hand corner for a box, and CHR$(174) would be suitable for a top right hand corner for our box. So, in order to begin setting up our box we can add two lines to our program:

```
290 X=2:L$="":A$=CHR$(176):B$=
CHR$(99):D$=CHR$(174)
300 FOR I=1 TO 32:L$=L$+B$:
NEXT I
```

We need to learn four more commands before finishing off our box, although only three are strictly necessary, and for the fourth we will require a brief diversion.

Under Commodore Basic we have something like 38,911 bytes of memory to play with. What does this mean? Well, a byte is a computer-speak for a character, like a letter of the alphabet for instance. So, roughly speaking, we could type in 38,911 characters in our program before running out of memory. Whenever we enter a new line in our computer program it occupies part of this computer memory, and a useful command to let us know how much memory we have got left is PRINT FRE(0). However, if you type in a command such as a letter of the alphabet equals a number (A=20, for instance) and press RETURN, if you then PRINT FRE(0) you will see that more memory has gone. Repeat the process with another letter, and still more memory disappears. Where is it all going to?

Think, for a moment, in terms of a large box. At the left hand side of it goes your computer program, taking up a certain amount of space. Whenever a variable is declared, it goes at the right hand end of the box. Gradually, if enough variables are declared, the contents of the left hand edge of the box meet those of the right hand end, and the box runs out os space

cont. on next page

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continued from page 23

and the computer runs out of memory. Typing X=25 takes up space at our right hand end. Typing X=26 takes up more space, for the computer not only stores the current value of X but also the previous one. To get rid of all this unwanted space that is taken up by previous definitions of variables we use a variation of the FRE(0) command:

OK=FRE(0)

Here, OK could be any variable, I just use it for convenience. The FRE(0) side of things performs what is known as 'garbage' of old variable definitions or errors is tidied up, and (to continue with the box analogy) everything is pushed up to the right hand end of the box again, leaving more room for our programs. In any Basic program, it is always wise to make use of this statement.

Three more commands, then, after this diversion. Most typewriters have a TAB key. Computers are lucky, they have a TAB keyword. If we want to print something at 2 spaces in from the left hand side of the screen, we use PRINT TAB(2);"SOMETHING TO PRINT", or variations thereon. We could also use (by taking our old friend X=25) PRINT TAB(X);"SOMETHING ELSE".

Sometimes we want to expand a string variable, as is the case with our box. Remember L$ in line 290? This was initially set to be what is termed a 'null' string, That is, it contains nothing. Why, then, should one bother to tell the computer that it exists at all, if it's got nothing in it? Well, it might have had something in it at one point, we now want to ensure that it doesn't. L$ is going to form part of our box, using the character strings mentioned in line 290.

310 Z1$=A$+L$+D$:PRINT TAB(X);Z1$:E$=CHR$(98)

We have now introduced a new string, E$, equal to CHR$(98). Try PRINT CHR$(98) to see what it does: it is a verticle line shape, which will again be used as part of the box. With a new string we shall also look at a new command. As you can see in lines 300 and 310, Z1$ consist of a left hand character, 32 straight lines, and a right hand character. Consequently we want a string now that has a left hand character, 32 spaces (into which we will print some information), and a right hand character. Left and right hand characters are the same, now, being a vertical line, so all we need is 32 spaces. Line 320 of our program shows us how:

320 Z$=E$:FOR I=1 TO 32:Z$=Z$+" ":NEXT I:Z$=Z$+E$

We will now define two further strings, for the bottom left hand corner and bottom right hand corner of the box respectively. The straight line shape remains the same as it ever was.

330 FOR I=1 TO 19:PRINT TAB(X); Z$:NEXT I
340 I$=CHR$(!-?):K$=CHR$(189)

There are several ways in which we could define the bottom of our box, but we will do so and finish for this month by introducing one last command, which is to do with strings. Having set up a string, it would be nice to look at individual portions of it, and the command to do this is MID$. Remember Z1$ earlier? If we want to define another string equal to just the 32 straight line shapes, we would use Z$=MID$(Z1$,2,32). That is, take 32 characters out of Z1$ starting at the second. To illustrate this still further, if we define NAME$="PETE GERRARD", then what would be the result of typing PRINT MID$(NAMES,6,7)? Try it and see! Substitute your own name for mine, and see what happens when you experiment with the MID$ command. For now, the bottom of our box and the last two lines of our program for this month:

350 X$=I$+MID$(Z1$,2,32)+K$
360 PRINT TAB(X);X$:OK=FRE(0)

We stated at the start of this article that there would be some homework to do each month. Well, we will start with something fairly simple, just to get you into the swing of things, and all I will ask is that you type in the program lines given and save them on an empty tape or formatted disk. Call the program MENU, and save it to disk using the command:

SAVE "MENU", 8 — *tape users just*
SAVE "MENU"

Then, to retrieve it from disk for further use, type:

LOAD "MENU", 8 — *or*
LOAD "MENU"

If you want to see what is on your disk, use the LOAD "$", 8 and LIST commands.

Note that this erases any program currently sitting in the computer's memory, so SAVE it before looking at the directory (fancy name for the list of programs on the disk).

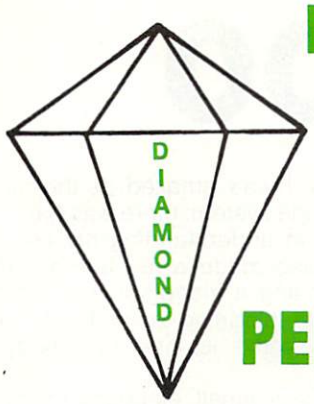
Now, to run your program after you have typed it in and saved it, just type:

RUN

and, provided that you have typed it in correctly of course, a large box will appear on the screen. If you have made an error in a line, simply type the whole thing out again, correctly this time. We will look at quicker ways of correcting mistakes, or editing lines as it is known, next time around. We will also see how to get the box drawn onto a nice, clear screen as well. For now, try designing boxes of different sizes, until you are completely at home with these Commodore Basic commands and keywords. Until next month, then

P.G.

```
880 PRINT"[HOM][CD3][CR8]IT SEEMS YOU PUSHED
885 PRINT"[CD][CR8]LUCK TOO FAR AND RAN OUT"
890 PRINT"[CD][CR8]OF MONEY.THEREFORE YOU"
895 PRINT"[CD][CR8]WILL HAVE TO TAKE OUT"
900 PRINT"[CD][CR8]A LOAN OF £5000 AND PAY"
905 PRINT"[CD][CR8]IT OFF WHEN YOU CAN."
910 PRINT"[CTLB][CD][CR12][WHT]PRESS SPACE BAR
915 IFPEEK(198)=60THEN920:ELSE915
920 LOAN=1:LN=5000:ACC=ACC+5000:GOTO425
925 PRINT"[HOM][DGRY][CD3][CR7]YOU
930 PRINT"[CD][CR7]YOU
935 PRINT"[CD]
940
```



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Hearsay 1000

One of the most interesting areas in the world of computer science is that of voice recognition, as this will someday be the way will interact with our computer systems. All of the major companies and research establishments are experimenting with various systems.

Voice synthesis has been about for some time now, and in various formats, both hardware and software. The CBM C64 and C128 have one of the most powerful sound generator chips of any 8 bit micro, enabling software developers to include speech into their products for a number of years now. There are even a couple of packages that allow you to develop your own words and use them in your own programs.

The Commodore's SID chip was never designed to produce speech, regardless of the complexity of the software driving it, and it is a credit to the original designer of the chip that it performs as well as it does. Advances in understanding how speech is generated have led to a whole series of custom built intergrated circuits that are designed to produce speech; the result of which has been that the quality is much better than that generated by the SID chip on its own.

Hearsay 1000 is a hardware/software arrangement that plugs into the expansion port of the C64/C128. A small box (140mm by 105mm by 30mm), it also has an inline connector that plugs into the video socket on the C64 and the lead to the monitor plugs into the free socket attached to the Hearsay 1000. (This provides the Hearsay 1000 access to the monitors loudspeaker.)

Most of the software that is required to run the Hearsay 1000 is held in the ROMs that are within the Hearsay 1000 box. It acts in the same way as any other plug in cartridge does, thus making the majority of functions available without tedious disk loading.

Internally the Hearsay 1000 is a very well-made; the double sided plated through hole PCB the board is lacquered for protection and in general the mounting of the components is professionally manufactured.

Supplied with the Hearsay 1000 is a disk with various demos and utilities, which expand the functions of the Hearsay 1000 and turn it into a very nice unit. But more importantly the other side to Hearsay 1000 is that it can also be programmed to understand voice input.

There are several demos on the disk that show other products that make use of Hearsay 1000's ability to accept voice input, and I am amazed at the quality of the voice output from these demos.

There are hardly any menus involved in the system, and many will be surprised when the box talks back to you! There are a few keys that are used by the unit, but all of them are accessed *after* you press the restore key. This prevents interaction between the running program and the Hearsay 1000 functions. A help screen is available at the press of a key (shift H) in case you forget the command. In addition the voice generator can have its words edited by the speech editor, using the allophone system, but there is also a text to speech function that will convert a typed word into allophones. Once that is done you can then 'tweak' the allophone entry if the conversion is not quite right.

Hearsay 1000 can understand 64 words that *you* decide upon. The method of training the unit to understand new words is very simple. Press restore, press T, enter a number 1 ... 64 and press return. Press space bar and say word, press space bar and say word again. Press run/stop, that is all, the unit will then ask you to enter the command string that is associated with that word. I programmed it to understand LIST, CLEAR, and DIRECTORY the command strings were LIST, PRINT CHR$(147), and LOAD"$",8. I was amazed at the accuracy of the system; there was hardly any error in understanding my voice input. It also made a fair attempt at understanding a friend's voice, but it did show that training the unit with the operators voice is vital to smooth operation.

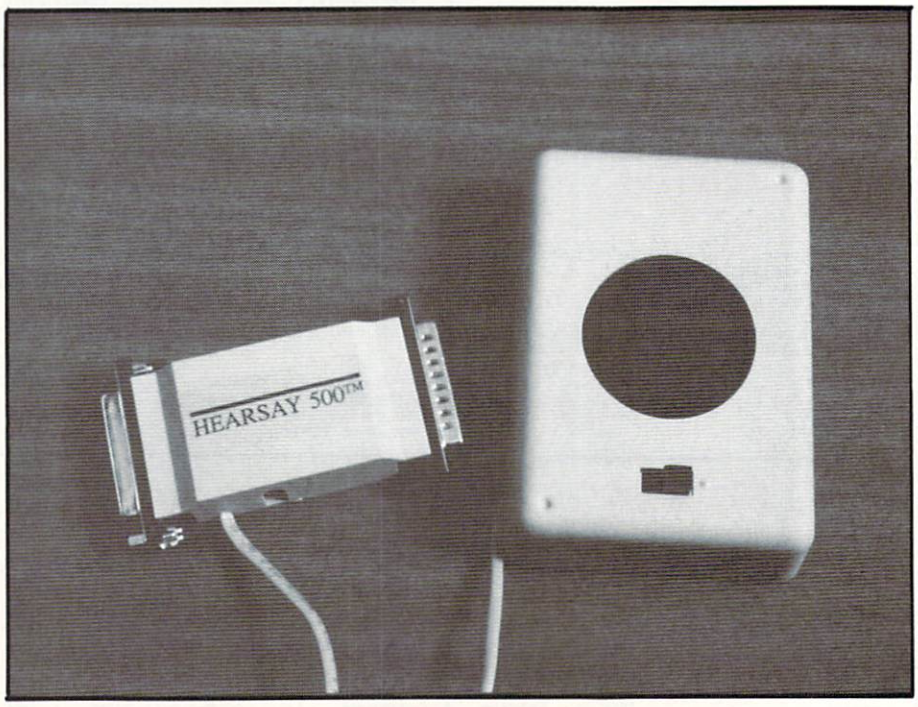
There is a small electrect microphone mounted on top of the unit, and my only complaint that if it is being used by the owner of a C128D, it is rather far away.

Full descriptions of the demo programs are included in the manual as well as the commands for the utility programs. A fast disk loader is included as a software option, this will load the files up to five times faster than normal, but it can be turned off if required.

Hearsay 1000 is a remarkable product, and could find itself put to many uses. It is one of those products that is limited only by the imagination of the person who programs with it. The primary interface from Hearsay 1000 is the command strings that are generated in response to a spoken word. This command string would be entered as an INPUT into the users program and then that program can act on it. The command string is output in such a way that the C64 thinks that it has come from the keyboard. Overall, it is highly recommended.

A.E.

See special offer on page 27.



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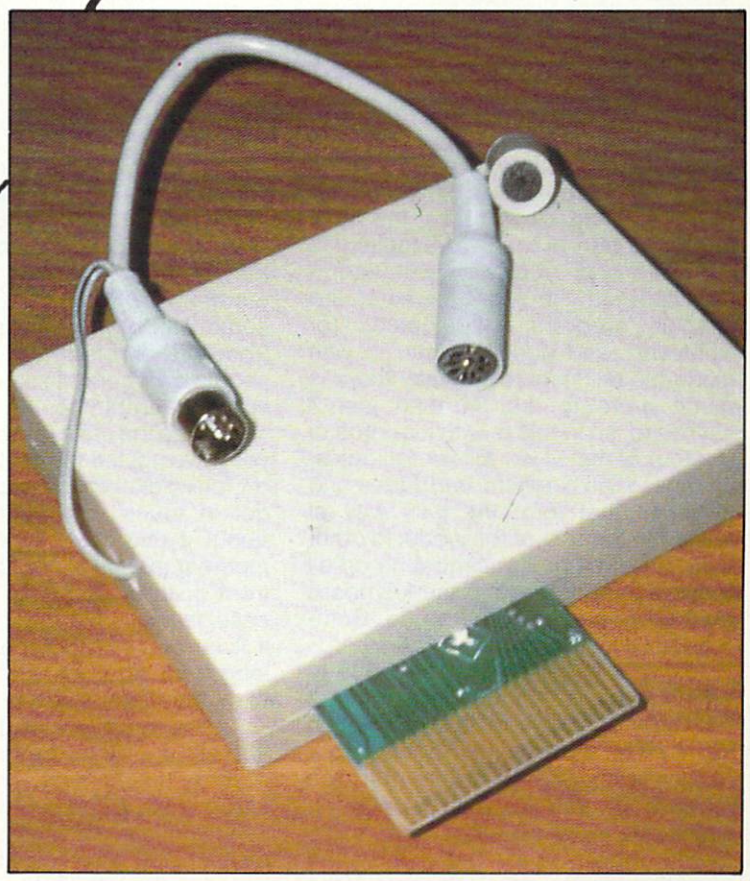

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SPEAK TO HEARSAY 1000 AND YOUR COMPUTER WILL OBEY!

More 64 Power

Part II

Peter Gerrard takes a look at the pins, sockets, cartridges and switches that link your 64 to the rest of the world

In the first instalment of our voyage of discovery around the 64 we looked at the keyboard. Arguably the most important part of the 64, because it is the only way you will really communicate with the beast, the keyboard lets us program, load games (or whatever), and generally get on with using the 64. Needless to say there is much more to the 64 than just a keyboard, so in this month's portion of our tour of the 64 we will take a look at all those pins, sockets, cartridges and switches that form the 64's way of talking to the rest of the world. In other words, we will be concentrating on all those things other than the keyboard that form the outside of the Commodore 64.

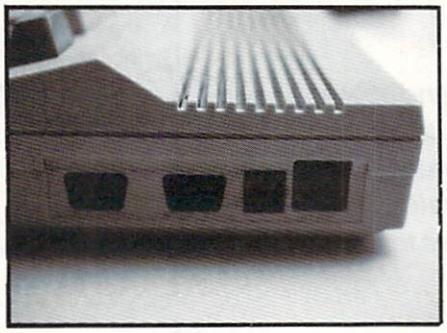
The first thing we need to do is to define precisely what we are going to be looking at. There is no point in saying "this is the user port" if the poor reader is left staring at any one of a number of sockets and wondering which one we're on about. Fortunately Commodore have kindly labelled everything for us, although some of the sockets have come to earn other names over the years that the 64 has been with us.

If we start by looking at the 64 from the front, and then turn it around so that the back is now facing us and the SPACE bar is on the opposite side of the 64 from us, what do we find? Reading from the right we have the aforementioned user port, the cassette interface, a serial port and something labelled as a video port, the mysterious letters RF, and finally what Commodore term the expansion slot but which everybody else refers to as a cartridge slot.

On what is now the left hand side of the machine there are four other items of interest. These are the slot for the power modulator, an on/off switch, and control ports 2 and 1. At least, Commodore call them control ports, but the rest of the world seems to regard them as joystick ports, and so we will refer to them as such from now on. We'll begin our tour this month by looking at these four things first and leave the more interesting stuff for later.

The slot for the power modulator is fairly obvious, and when setting the 64 up one just pushes the appropriate connector into place and then puts the plug at the other end into a wall socket. Early modulators had an alarming tendency to overheat, and indeed some later models still seem to suffer from this problem, but none of them should ever become so warm that they are unbearable to the touch. If this should be the case (and assuming that you have not left the machine switched on for weeks) then I suggest that you get in touch with your local dealer about it and have a good moan. Or moan at the person that you bought it from in the first place. Whatever the case, the modulator will always feel as if it is running a temperature, but as long as it does not get too hot then there's nothing to worry about.

The on/off switch next to it is just like any other switch. Press it one way to turn the machine on, press it another to turn it off. With the power modulator in position and the computer switched on then the red light above the keyboard to the left (looking at it from the front) should come on. If it does not then there is something wrong somewhere, but assuming that it does then we are all right and can carry on. Incidentally, if you are using joysticks/cartridges or anything of that nature, always make sure that everything is



plugged in and in position before turning the 64 itself on. Then you can move on to disk drives, printers, etcetera, 99 times out of 100 nothing will happen if you plug a cassette deck in with the power on, but the 100th time will cost you a trip to the local dealer as well as a sum of money.

This brings us to the two joystick ports, and oh! the complaints about early game software for the 64. Half of them required that you use joystock port one, half of them that you use port two, and half of the whole lot didn't tell you which port to use at all until the game had actually started and you were under enemy bombardment and in imminent danger of death and destruction. Why two ports? As Barry Norman would say, and why not?

Unless you are writing a two player program, in which case of course you will be using both ports, most people seem to stick to port two and leave port one well alone. I cannot think of any particular reason why, but it might be something to do with memory location 56320 being a relatively easy number to remember. No, just a joke, but 56320 is indeed the location to PEEK at as you waggle the joystick around, press the fire button, and so on.

There are innumerable different types of joysticks, and CCI has done sterling work in the past in featuring reviews of as many of them as possible. Of course, joysticks are not the only thing that can be connected to these two ports. Light pens, mouses omice?), all sorts of things make use of them, and a blessing on Commodore for putting the two ports where they are. Have YOU seen where the ports are on an Atari ST? You will not, either, unless you crane your neck or lift the computer up.

Well, that has taken us through one side of the 64, let's take a look at the rest of it now. Assuming that you have the machine with its back to you, we will move over to the right hand side of things and start with that rather large slot bearing the label 'user port'.

More 64 Power

It might be called a user port, but few 64-ers ever seem to use it (cue deluge of letters, but I can only speak from personal experience). Its existence seems to date back to very early Commodore days, when the company were competing with Apple and Apple had a habit of putting this user port into their computers. Commodore had to do likewise, giving the final computer a user port and a printer port as well. The Vic swapped printer port for cartridge port but still kept the user port, and so the 64 did the same.

This is not to say that nobody uses it, for Datel Electronics most certainly do. They have an Eprom programmer, for instance, which slots onto the user port to allow free use of their other products (or those from a different company) that require the cartridge slot. It is useful to have, full marks to Commodore for keeping it, and ditto to Datel and others for exploiting it. Just because I have never used it doesn't mean that others won't, but it seems to be that if you are going to use it then generally speaking you KNOW that you're going to use it before buying the computer, and thus that already takes you beyond the level of this kind of article.

Moving on, we arrive at the cassette interface. Early Commodore PETs had two such interfaces, one inside the casing of the computer and thus relatively difficult to get to, and one outside and more readily available. If memory serves this continued even with their business machines, but come the Vic and the 64 we were down to just the one interface. This reflects the growing availability and reliability of disk drives, something early PETs did not have.

But, cassettes were popular in the early days and so we still have them.

When the 64 first appeared everyone was quick to point out that you did not necessarily have to use a Commodore cassette deck. Any cassette deck would do, provided that you did a little bit of soldering and acquired the correct interface to slot into the 64. There was only one problem with this argument at the time, and that was that the only people selling the 'correct interface' were in fact Commodore. The price of it meant that you might as well get a Commodore cassette deck in the first place. After all, you did not have to fiddle about with volume controls, the device is pre-set specifically for Commodore computers and should not need adjusting. The head should periodically be aligned and cleaned, but that is about all. Times have changed, naturally, but even now you might as well use the manufacturer's recommended tape player.

If this dependence on Commodore tape decks was important in these early days, it became supremely important with the advent of a thousand and one different turbo-loading systems, all of which had to have a Commodore deck reading the signal from the tape in order to provide any sort of chance of the program loading successfully.

As far as I am aware, and I am sure someone will tell me if I am wrong, there is no other use for the cassette interface other than to use a Commodore tape deck. The deck takes its power from that interface, it does not need its own power supply, and that is that. When Commodore some years ago brought out their 'portable' (transportable, more like) 64 with its tiny monitor and built-in disk drive, there was no cassette interface left. Why, then did the majority of the code for using it still remain in ROM? It is a great mystery of our time, number 1,736. Since we have mentioned disk drives we might as well move one pace smartly to the left and look at the serial port sitting invitingly next to the cassette interface.

The first disk drive that was available for the 64 was the 1541, and it is probably still the most popular of the Commodore 64 drives. It is slow, but so are most other Commodore drives, and as we shall see when we look at the cartridge slot there are many ways of speeding up the drive so that it achieves a more acceptable level of performance. This slowness is due to the 64 needing to accept what is termed a serial signal, rather than a parallel one. In other words, data comes in one bit at a time rather than in larger chunks simultaneously. This is one reason why you cannot use the Plus-4's 1551 drive, for instance, without a suitable and seemingly impossible to find interface.

Nowadays we have the 1570 and 1571 (more more!) from Commodore, as well as other drives from other companies. The Enhancer 2000, for example, or the Oceanic OC-118 (which used to be known as the Excelerator Plus and has now adopted a pseudonym), are both fast disk drives capable of operating at much greter speeds than any of the Commodore ones. Whether they are really 100% compatible, though, is another matter, for some companies use weird and wonderful ways of protecting their disks and these methods might not be acceptable to the fast drives. Most things are, though.

One nice thing about Commodore drives is that they have two serial ports on the back of them, so that you can link up another disk drive in a sort of daisy chain, or add a printer on to the end of it all. Having two disk drives means giving them different device numbers, something Jack Cohen has covered in his technical letters page before now, as well as giving good advice on the vast array of printers that can be hooked up to a 64.

Next to the serial port comes the video one, whose main use in life seems to be to connect the 64 up to different types of monitors. If I could be described as an average 64 user, then the average 64 user never uses the video port.

The little hole with RF written by it is used for connecting the 64 to the television with the cable provided. Interestingly enough, Spectrum computers used to use (they may still do) the same cable, as I discovered when a Spectrum of mine wasn't operating properly and only worked when the 64 cable came to the rescue. There is no other use for this port that I know of.

This brings us to the last and most widely used port on the 64, the cartridge or expansion port. So many devices have been built to link up to this port that you could fill an entire magazine writing about them, but there are all sorts of cartridges for saving protected programs, copying them, speeding up disk drives, adding a window environment to the 64, using the 64 as a drum synthesiser, adding modems, adding memory, adding graphics, adding just about anything that you could possibly think of. If you come up with an unusual idea for a cartridge for the 64 you could more or less guarantee that one exists, somewhere. They even have cartridges for holding more cartridges, saving wear and tear on the port as you keeping putting them in and out.

Well, that brings us to the end of this month's lightning tour of what constitutes the outside of a 64. Next month, another aspect of the 64 comes under scrutiny. See you then.

P.G.

Feature

The Vital Virus Guide — Part III

In Part I and II, Nancy Picard reviewed the common Amiga and PC viruses and how to prevent infection. This month, she compiles a guide that is essential to every virus fighter. To begin, some DOs and DO NOTs of viral infection protection:

DO

Switch off your machine between using disks. This practice will kill any virus currently in memory.

As a rule, keep your disks write protected (either with the tab, for Amiga disks, or with a lable, for floppies). It is not perfect prevention, as some viruses, such as the 648 type, start off by changing the file to read/write and then restoring it back to the way it was.

Keep in mind that trojan horses are not viruses. The main difference is that a virus is self-replicating, while a trojan horses is merely a hidden program. In other words, you may download something from a BBS, for example, that may perform strangely. Again, it is best to check the program either yourself or with a virus checking program. By all means, shut off your machine before inserting any other disks. It is a popular misconception that viruses are transferred on bulletin boards, but the most dangerous disks are usually transferred by infected floppies.

DO NOT

Panic. If you notice something is wrong, DO NOT put more disks in your drive to check if something is wrong. It is possible that your machine is actually defective.

As a general rule, buy disks from disreputable suppliers, including those selling pirated copies for much less than the suggested retail price.

Use several disks in succession, especially those from sources you suspect are not legitimate. Check any new disk first — if you know how, or with a virus checking program — and if you are in doubt, turn off your machine for several seconds before running other software.

Leave any floppies in the A: drive. Booting in this way leaves you susceptible to a virus waiting on the disk.

To clean up an infected MS-DOS Hard Disk from viruses that attack the Boot Sector (Italian, Brain, Stone...)

1. Boot from a clean disk

2. Move the good boot sector that the virus has stored in a fake bad cluster back to its rightful place or copy all the data off the disk, then reformat it.

3. Install a virus detector so that every disk you insert in your machine will be checked.

AMIGA

ICPUG: has a Public Domain library that has virus-related programs such as DiskZap and Sectorama, two different types of sector editors. The library also has Fred Fish disks that contain Vcheck (disk 126), a virus checker, in addition to several others. Contact ICPUG at 32 Brancaster Road, Newbury Park, Ilford, Essex, IG2 7EP. Tel. (01) 590 8849 days and (01) 346 0050 evenings and weekends.

VirusX: Fish Disk 137. Note: Steve has also written DiskX, a disk 'fixer', which should be available on PD disks and in libraries. If you happen upon a new strain of virus, send it on a disk to Steve Tibbet, c/o Lynx Technology, 886 Somerset Street West, Ottawa, Ontario, CANADA K1R R7.

The Guardian: written by Leonardo Fei, it is executed at the start of the session and checks any disk inserted — currently only works with Workbench 1.2. A1000 owners can install it on the Kickstart code, where it will install itself every time you reset. Available for 3 from TRANSACTOR (UK), Unit 2, Langdale Grove, Bingham, Nottingham, NG13 8SR.

IBM/ MS-DOS/ PC-DOS

Anti-Virus Toolkit: includes 10 anti-viral programs that allow you to look at your disk, check for viruses, innoculate against viruses, and many other useful features. Available for 49 (plus VAT) from S & S Enterprises, PC Division, Weylands Court, Water Meadow, Germain Street, Chesham, Bucks, HP5 1LP. Tel. (0494) 791900.

continued on page 32

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1003-4	5¼" DS/HE 1.2Mb 10's	55p	50p	48p	P.O.A.
1004-4	3½" DS/DD 135TPI 720K 10's	70p	65p	63p	P.O.A.

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5002-1	V10 3½" diskette box holds 13 disks-Beige	1.99	1.49	.99
5003	NL50 5¼" diskette box No lock-holds 50 disks	7.49	6.99	6.49
5004	NL30 3½" diskette box No lock-holds 30 disks	6.99	6.49	5.99
5005	WL50 5¼" diskette box With lock-holds 50 disks	9.49	8.99	8.49
5006	WL30 3½" diskette box With lock-holds 30 disks	8.99	8.49	7.99
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continued from page 30

The Vital Virus Guide - Part III

IBM PC User Group: offer a program free of charge which will detect an infected program. Contact via modem on 01-863 6646 or write to PO Box 360, Harrow, HA1 4LQ.

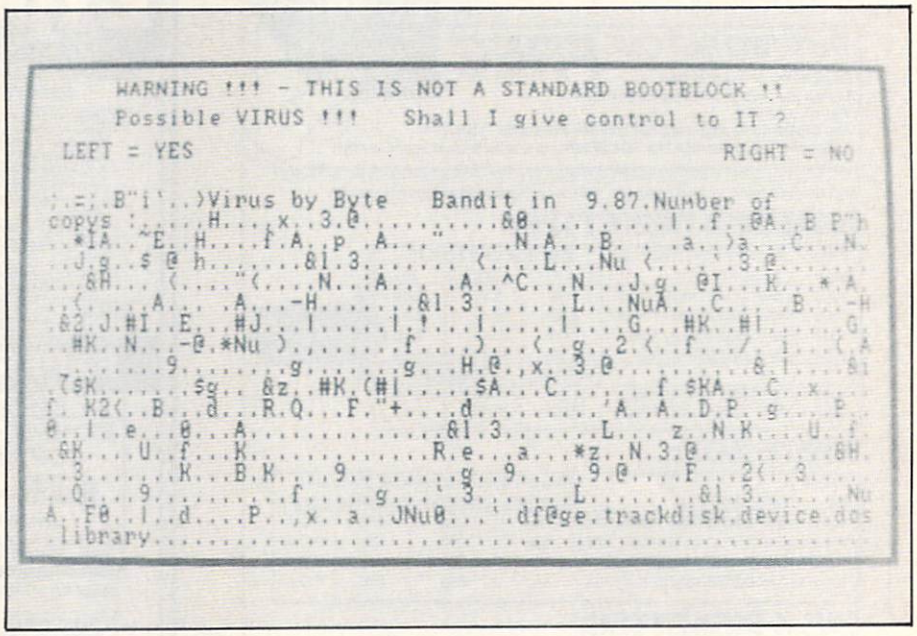
You can also obtain a program called Testvacc, which tests the effectiveness of virus checking programs. Written by Alan Soloman, chairman, it is available as shareware (or, if you are not permitted to use shareware, it is available from PC Business Utilties, Weylands Court, Water Meadow, Chesham, Bucks, HP5 1LQ for £5). NOTE: If you do have the program, make sure that you got it from a reputable source and not from Compulink's CIX or the PC User Groups's Connect, as the program appears to have been altered to trash hard disks. (Testvacc is included within the virus toolkit sold by S&S Enterprises.)

Chatting: with a virus writer, downloading virus protectors and other handy virus stuff is available to anyone who has a modem. Contact (0905) 52536, 58030, 57822, 754127, or 754151. J.W. Brooks is the Sysop, yearly charge, and the BBS may be used freely.

Check-It!: claims to detect virus infestation and Trojan Horse programs by comparing details with executable fields (.EXE, .COM and >SYS extentions) against data in its database. The package includes details of various viruses and other general advice and is available from Zortech, Tel. 01-316 7777.

Computer Threat Research Association (COTRA): is a non-profic making organisation set up with the help of Novell to provide protection agains viruses and other computer systems. Contact Novell by accessing the Computlin CIX system (30 membership fee), contact techincal services at Novell UK. Novell also offers BR's 1813 virus protection software on Novell's Netwire Bulletin Board.

Inoculate: a short porgram that inoculates .COM files against the 648 virus by using the virus' own self-recognition scheme to make it think that it has already infected your files. Available for 5 from Inoculate 648 Offer, PC Business Utilities, Weylands Court, Water Meadow, Chesham, Bucks HP5 1LP.



Oasis, Opal: office automation and network management systems developed by Knowledge Network Systems that restrict users access to their personal workstations, available for 2995 per server (US) from KNS, 3800 Concord Parkway, Suite 1800, Chantilly, VA 22021. Tel. (0101) 703 968 0378.

KAJP Software: offer anti-virus software for PC users. Contact them at 10 Church Road, Fornborough, Hants, GU14 6QL. Tel (0252) 332955.

PC Week Magazine: often features virus articles in every issue and keeps up to date with the latest UK virus information. In additon, you can contact the Power Tower BBS at 0533 880114.

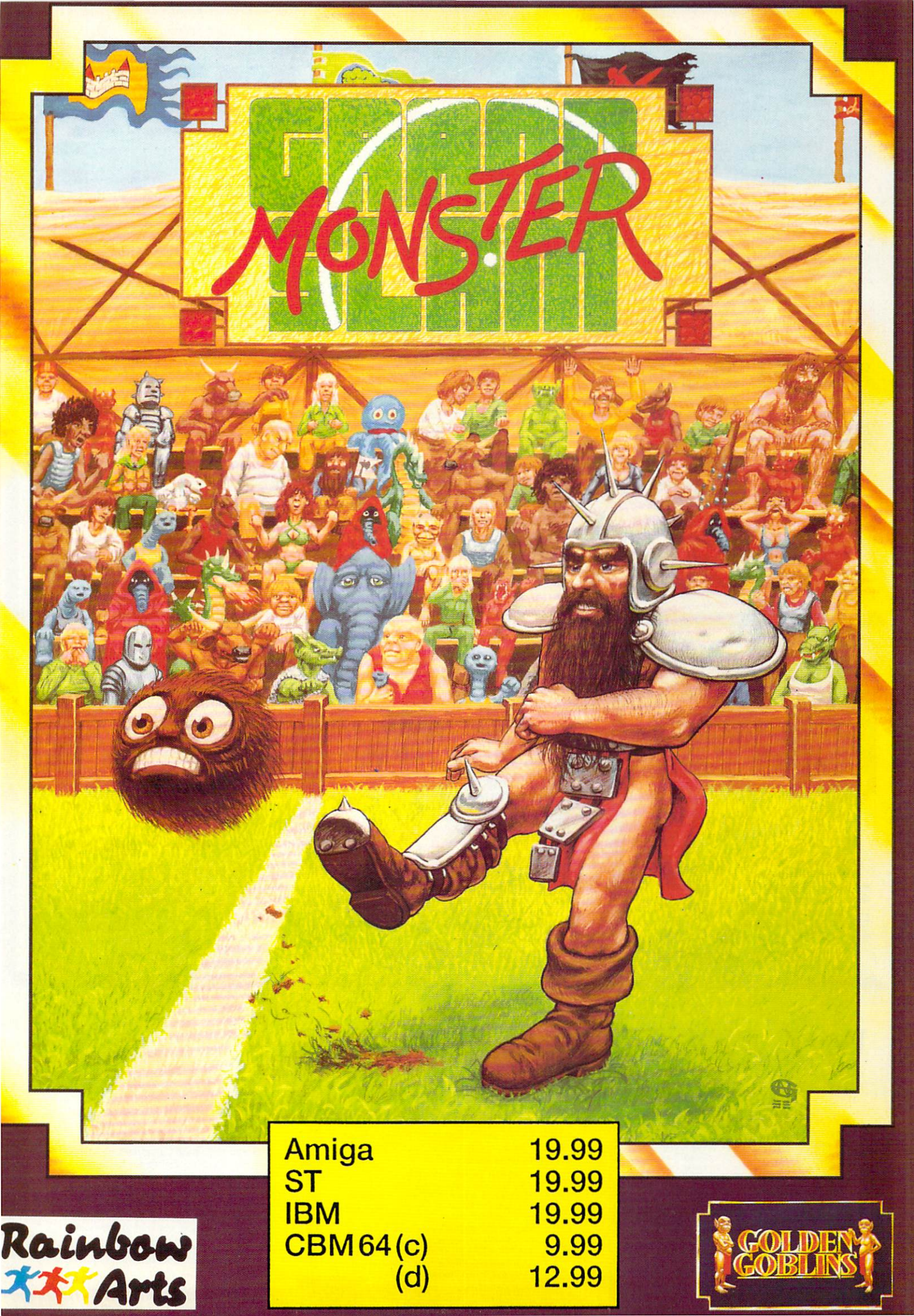
BOOKS:

'The Complete Computer Virus Handbook' by David Frost: produced by Computerised Informations Systems — Adult and Business Service, Price Waterhouse's technical arm, have began publishing a handbook and supplements to describe viruses, their transmisssion, methods of detection and eradication based on the MS-DOS/PC-DOS environment. The first edition lists ten known viruses, details about 26 anti-virus products and the type of protection each one provides. The CIS department itself will answer technical enquiries by telephone and will also investigate specific infections. Available from Price Waterhouse for 15 (supplements cost£5 each). Tel. (01) 407 8989.

'The Computer Virus Crisis' by Philip Fites, Peter Johnson and Martin Kratz: a basic book directed to the non-techie in all of us. Available for £13.95 from Chapman and Hall. Tel. (01) 583 9855.

'Computer Viruses — A High Tech Disease' by Ralf Burger: noteable for its inclusion of actual virus code written in Turbo Pascal, BASIC and batch file languages and general, clear descriptions of anti-virus precautions. Published by Abacus, it is available in the UK for £17.45 from Computer Manuals Ltd. Tel. 1 55755 043 3.

This concludes CCI's series on the virus threat. However, if you have any additional information, please send it to Nancy Picard, in care of CCI.



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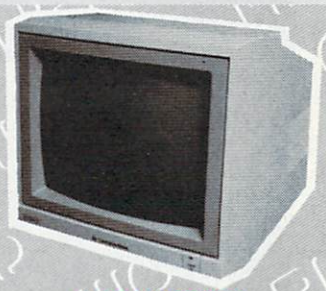

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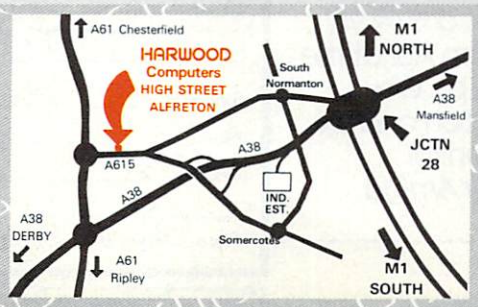

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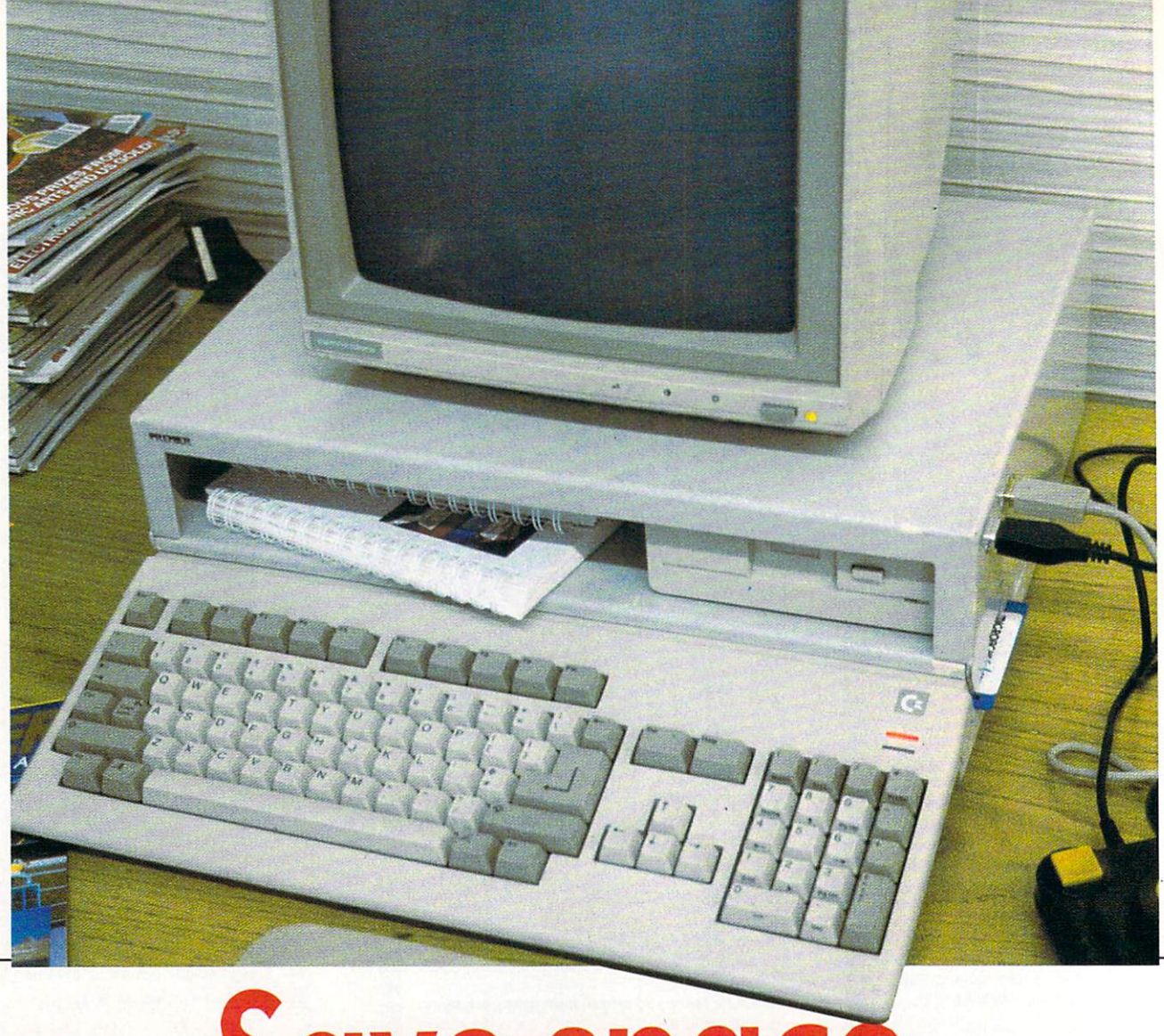

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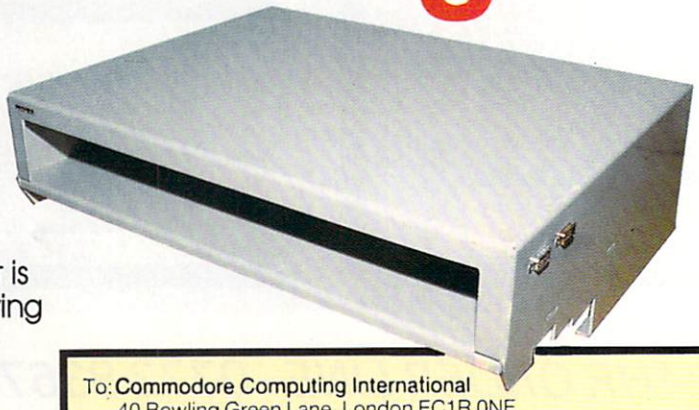

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'METROPHAGE'

by Richard Kadrey

Recently there was a report of a court case in which an artist, and the owner of a gallery, were charged with committing an act of outraging public decency by displaying, on the head of a mannequin, a pair of ear-rings made of two, three-inch long, freeze-dried human foetuses.

Nimble Virtue, one of the characters in 'Metrophage' by Richard Kadrey, would certainly not have been shocked by the sight at all. She carries around with her, in a velvet-lined case, the foetuses of her two still-born sons. And Ms. Virtue is not the only character in this book with odd haits - and just as odd names.

The hero is Gordon João Acker, aka as Jonny Qabbala, drug taker and dealer, petty thief, a street-wise but not too bright specimen of hmanity. He is continually falling foul of the various villains, being beaten up, shot at, captured or all three. But, inept as Jonny is, one cannot help liking him. he has a natural ability to bounce back and the redeeming quality that he is, above all and despite many temptations, true to his code – such as it is – and his two girl-friends/lovers, Sumi and Ice.

'Metrophage' is a fast-moving, well-drawn story of what – Heaven forbid! – life might be like in Los Angeles in 2040 AD. (Strange how often L.A. is the setting for these books 'noir'). L.A. has become the base for all kinds of evil doings, there doesn't seem to be one out-and-out decent person living there. Or, at least, Jonny never seems to encounter any.

The world is split between the Arabs and the Japanese, to the detriment of everyone else, there is a plague of a leprosy-like disease affecting much of the population and of those who are not affected seventy-five per cent seem to be on the make or drug dealing or involved in something shady.

Jonny gets on the wrong side of reptillian-like Colonel Zamora, chief of the Committee of Public Health, for whom he once worked. (As a matter of fact Jonny left the Committee's employ in a bit of a hurry. He had shot his immediate superior, a one-eyed brute named Cawfly, through his one good eye. Zamora is willing to overlook this slight error of judgement if Jonny will infiltrate the smuggling ring of drug lord Conover and bring back information on Conover's supposed allies, a group of extra-terrestrials called the Alpha Rats.

On the way to Conover's mountain eyrie Jonny runs into, in more ways than one, the Croakers. These are a revolutionary group of erstwhile doctors, plus anarchists and outlaws, who have gone underground to try and treat diseases that officially do not exist and, it seems, there are plenty of those around.

It is with the help of the Croakers, and Sumi and Ice, that Jonny finally manages to reach Conover – a real weirdo if ever there was. At least one hundred and fifty years old, he exists on a drug called 'Greenies' and, because of the damage it has done to his system, has to have a blood and cyclosporin change twice a week. He also, in his underground laboratory, clones his own organs to enable him to have transplants twice a year, an essential without which he would die. But there is more to Conover than – if you will pardon the expression – meets the eye. Unfortunately, Jonny, in trying to find out what it is, is blinded. He does regain his sight but in a way in which he neither expects or desires.

If you saw the film 'Blade Runner' you will have some idea of the atmospheric feel of 'Metrophage'. Dark streets, full of menace, doublecross and double-double cross, a bizarre society that accepts deviation as the norm and lives for ever-increasing self-gratification, while, underneath, it is slowly purtrefying.

'Metrophage' is Richard Kadrey's first novel. On this showing he is a name to watch in the field of science fiction.

D.M.

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Troubleshooting and Repairing Your C128

by Art Margolis

You..the proud owner of a C128 computer, turn it on ready for a heavy programming session, or to once again take on the Thargons. Nothing happens! what do you do:

a) Hit computer
b) turn it off and on again
c) remember to plug it into the mains
d) panic
e) reach for you trusty Troubleshooting book

Choices a,b,c,and d are all very common responses to any form of trouble on the C128, or any piece of electronic equipment for that matter. Choice (e) is a little bit harder to decide upon. It will depend to a large extent on who you are.

I am always very wary of this type of book, and I have to be very careful to try to put myself in the place of Mr average computer user. It is often stated in this type of book, that you can save a lot of time by repairing 50% of the faults that occur. In practice I think that you will be limited to changing the odd fuse.

This book has a ' simple ' troubleshooting section that should get rid of most of the common faults, such as broken power units, but it is NOT produced in a way suitable for Mr Average, and I do not think that Mr Average would have little patience trying to wade through this section, as it rambles on far too much, and also gets sidetracked every other paragraph.

What this book lacks is a nice easy to follow troubleshooting chart, even for the simple ' silly ' faults like forgetting to pug the computer in, or having an auto fire joystick plugged into port 1 thus putting garbage on the screen. So I am sorry to say that Mr Average can forget all about this book; it is not for him.

If I now look at it from a engineer's point of view, than this book has a lot going for it, after you rip out the first 60 odd pages. The desoldering advice is a hoot, even King Tut might have raised a smile or two at it. It describes a system that involves reheating the joints several times and picking the solder out with a 'pick'. This is a sharp pointed tool, that I do admit has its uses when scraping away accidental ' wiskers ' of solder between the pins of chips, but it should stay well away from solder joints!. To explain my reaction to this, and to state something that the book does not make clear at all, is that this is the most expensive item in the C128, which probably costs as much as all the chips put together. It is of the plated – through hole construction, which is a method of putting copper metal down the inside of a hole,

continued on page 39

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SecureWord

Andy Eskelson reports on a utility developed by Esoteric to meet the growing need of data security

If you keep financial information or other private files in electronic form, you may not want to make it readily available. Both electronic (hardware) and software methods are available to the user to encode his data in such a way that only he can retrieve it in a coherent manner.

SecureWord claims to be such a software solution. SecureWord is an easy to use program that will create an encrypted version of a specified file.

After selecting option 7 from the main menu and answering a simple question, you enter your company name, or any other string up to 15 characters long. This will then display a number and you must write this number down as it is used to decrypt your files.

The program works on the C64 or C128 (in C64 mode) and is very easy to use. Once the installation is done, the option to install the disk is removed. Each copy of the program is registered and Esoteric will help you if you forget your decrypting number.

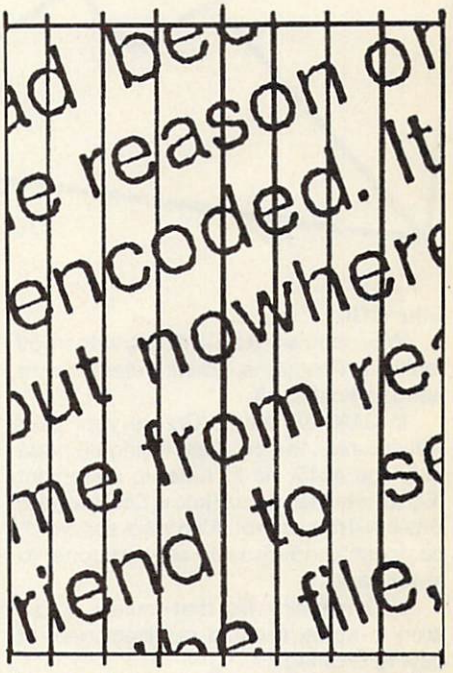
So how does SecureWord measure up? Unfortunately not very well. One problem that I found was that if you selected the encrypt option, there was no way to cancel the operation. I had to put in a nonexistent file name and let the program run its course. Even when there is no such file on the disk, Secureword happily creates a file with the name that you typed in as an encrypted file.

Secureword works on any standard sequential file, such as created with Superscript and writer 1295. However, I decided to test it on a straight ASCII file that I downloaded from a BBS system.

After installing the disk as instructed, I called myself EC Software and a code number was displayed. I then selected the encrypt option. The first problem was that I had forgotten the name of the file that I was going to encrypt, it was then that I found that there was no way to get out of that option. When I sorted out that problem I was able to encrypt the file without any problems. The program indicated the progress of the encryption process so the user is not confused.

I then set out to determine the quality of the protection. As the file is saved as a USR file I wrote a very simple file reader program that simply displayed the file on screen. When I did this all I got were lots of graphic characters. Back to square one, I thought. However, I just happened to switch the C128 into the uppercase/lowercase mode (shift CBM) and the file started to make sense! In fact 90 per cent of the content was intact and quite readable, spaces had been replaced with another character, and numbers had been encoded as well, but for some reason only the odd letter had been encoded. It was a fairly high number but nowhere near enough to prevent me from reading the file. I did ask a friend to see if he could understand the file, just in case I was deluding myself, as I knew what was in the original file. Sure enough, my friend was able to read the file and guess at the missing parts quite well.

This program will fox the casual snooper, mainly due to it using the USR file type, but to any mildly determined character, it is easy prey. SecureWord needs a few modifications on its encryption system to make it into a very good product. It really needs a small modification of the program to test for non-existent files and also to allow the user to abort an operation; if included, these improvements would make this program a very useful utility. The price of this software is very low and once these small problems are sorted out, I am sure that many users would like to have SecureWord among their utilities.



A.E.

Price: £8. Contact: Esoteric, 15 Lanmore Estate, Lannes, Redruth, Cornwall, TR16 6HN.

continued from page 37

Troubleshooting and Repairing Your C128

making a connection form the top surface of the board to the bottom, and at the same time providing a hole for the legs of the chips. You can imagine the trouble that could be caused if you scraped away this thin layer of copper; it is one of the hardest faults to track down, as often what you end up with is the intermittent fault, that is one that comes and goes.

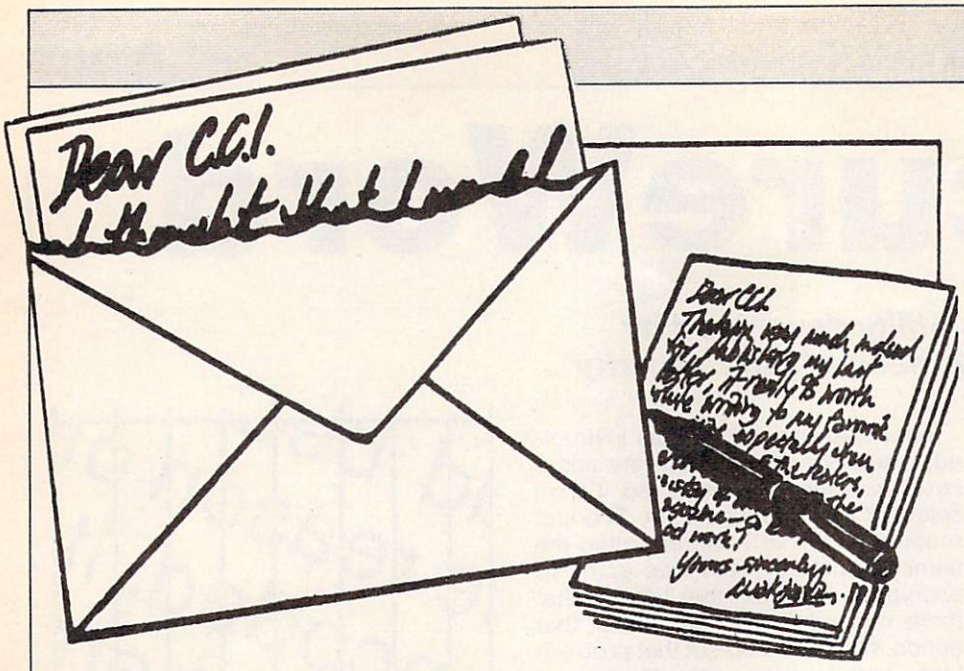
The information contained in this book is extensive to say the least. However it is a bit of a mixture, as it dives into the workings of the chips, to the extent of printing the internal circuit of some of the chips, as well as the RTL and DTL logic chips.

The book explains the operation of the main chips very well with good clear pinout diagrams, and a very good explanation of how they operate in the C128 circuit. There are hundreds of circuits, diagrams and charts in the book. The author has redrawn the C128 circuit diagrams, and they a much larger and very easy to follow.

'Troubleshooting and Repairing Your Commodore 128m, is not the book for the general commodore user; it assumes far too much of the user. It is a very useful reference book for the engineer and would find a good home in any repair workshop. A bit of pruning of the superfluous information would make the book even better.

A.E.

Published by TAB Books inc. ISBN 0-8306-9399-8. Distributed by: John Wiley and Sons Limited, Baffins Lane, Chichester, West Sussex, PO19 1UD. Tel. (0234) 779777.



Dear CCI,

Why spoil an excellent mag with trivial faults i.e. Programs. I think Peter Gerrard needs a ticking off.

In JAN '88 issue, 'Create your own Adventures', the program listing on page 125, line 4115, he includes a statement 'ELSE' which as far as I know Commodore Basic will not accept. Also in his series A.I. he doesn't know how to convert upper to lower case.

Little mistakes like that could lead to a drop in sales, it could put beginners of buying the mag.

It seems also to point to your proof readers not doing their Job, or don't they know Commodore programming either. I hope Pete doesn't do much with M.C. in his programs or he could end up in a right mess,

Wishing you best regards for New Year,

J Quintin, Norwich

P.S. I have been a reader for the past 4 years and still have all the issues.

Dear Mr. Quintin,

The fault lies with me, not the proof readers, who after all shouldn't be expected to know the ASCII values of various characters or whether or not Commodore Basic has an ELSE command in it. Perhaps they all program in STOS on Atari STs or Mallard on Amstrad PCWs, and confidently expect other languages to be the same.

Anyway, it's my fault, so greater checking from me in the future, and a copy of everything I do to CCI so that they can load up and list out again if they want. Starting in fact, with this month's issue of the magazine.

Your point about beginners buying the magazine is a good one, and certain changes should be apparent in the magazine 'ere long to reflect the growing band of people who are still coming onto the C64 market. All those computers that were bought at Christmas, for instance, they can't ALL belong to instant experts! CCI tries to cater for every branch of the Commodore market, as you know, so keep buying and we'll keep trying to get it right.

By the way, if you've been buying the magazine for 4 years, you'll find a series on interrupts by me that ended up with a demonstration of six screens scrolling horizontally and vertically whilst playing a ten minute musical soundtrack and having a few sprites dancing around for good measure, all in machine code, so I don't always "end up in a right mess" when programming the 64!

All the best,

Pete Gerrard

Dear CCI,

I am writing in the hope that you will print this letter in the next issue of CCI to show that there are other C16/+4 owners that love these machines and still use them to the full.

The reason I am writing is to let you and other C16/+4 owners know that I have started a C16/+4 Computer Club. The Club will produce a monthly magazine called 'C16/C116/+4 Computing Monthly', this will be packed full of program listings, pokes, tips and reviews etc. The magazine will cost £1 per issue, OK, it may seem expensive compared to the quality of CCI, but you will have to take into consideration that I am running the club myself and the £1 pays for 1st class postage, an envelope, and the cost of producing the magazine, i.e. photocopying and paper.

If there are any C16/+4 owners that would like to sample the magazine then they can send a cheque or PO to the address below for the value of £1, and in return they shall receive issue one of the mag (APRIL 89).

I would also like to mention that ANY C16/+4 owner can join no matter what age or sex you are, your welcome here. Just because software houses have decided that these machines are not profitable anymore, that doesn't mean that there aren't any C16/+4 owners left because there ARE.

If there are ANY software houses out there still producing any software for the C16/+4 then I would be delighted to review it, just write to me at the address below.

Well CCI I hope I have not taken up too much space, but I must stress that C16/+4 owners are here to stay and we shall not be shut out like the poor VIC 20 owners were.

Nothing else to say really except thanks CCI for taking the time to read this letter and I look forward to hearing from any C16/+4 owners, bye for now.

Best wishes,

Roy Robinson

P.S. Please print my address below.

Roy Robinson, 112 Cliff Road, Hornsea, North Humberside, HU18 1JE, England.

There you are, another missive offering the poor neglected C16/+4 owners something to think about. We hope that it will be good value for the £1, and that it will keep on coming out.

Dear CCI,

I would like to complain about the dates you have just set for your competitions. Seeing I live in Tasmania, Australia we get and enjoy your mag but we get it a month late so we miss out on your comps.

So could you extend your competition dates or send your mag earlier to Tasmania?

I have a Commodore C64c and you can't get me away from it, so could you send me a game or a free subscription to the G.M. mag or maybe a t-shirt. I have games like Operation Wolf, and Double Dragon, my friends like computer games from U.S. Gold, Ocean and other games companies. They also enjoy your mag.

Please take my idea in hand about the dates for the competitions.

Yours faithfully,

Aaron Hunt, Tasmania.

Dear Aaron,

We certainly do give everyone a chance in CCI competitions by putting the date back as far as we can. For instance, in this issue every competition has a closing date of July – and we are published right at the beginning of May – in the U.K. at least. But to give you an even better chance we are going to put back the closing date from the 15th to the 30th of the month.

We can't send you a subscription to our role playing games magazine, DM, but a game is winging its way to you for sending the first Tasmanian letter we can remember receiving!

Dear CCI

I read your magazine every month and I must say that the contents are most interesting.

I am writing to you with reference to the actual magazine presentation. There must be at least 3 errors (spelling) – one on each advertisement page.

continued on page 45

THE ULTIMATE BACKUP CARTRIDGE GOES ONE BETTER...

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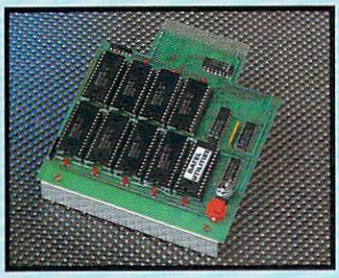

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- ❑ Select instantly from 8 sockets which accept up to 32K EPROM each.
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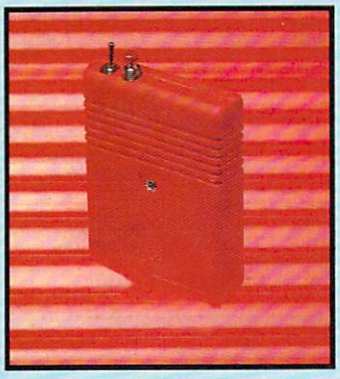

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- ❑ Unstoppable reset button. NOTE:- user port cheaper type reset buttons offered by others are not unstoppable.
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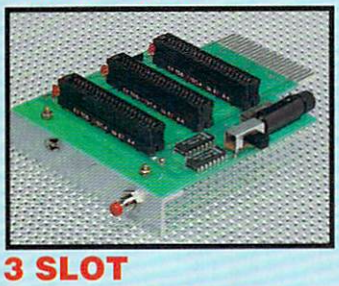

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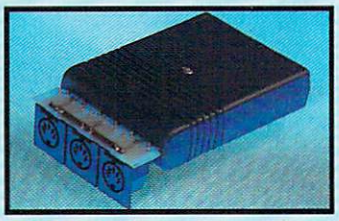

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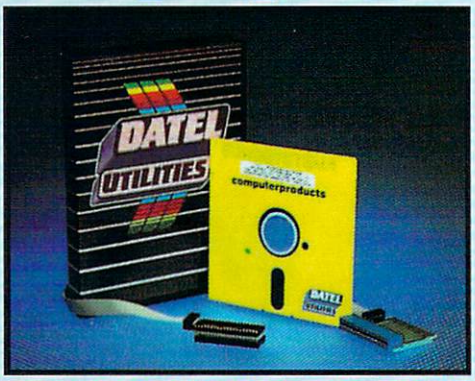

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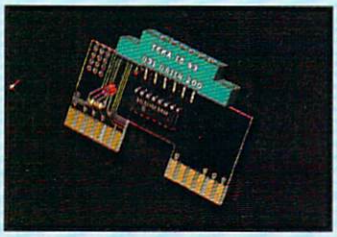

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- ❑ The most effective tape to tape back-up board available.
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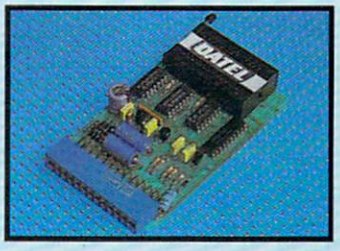

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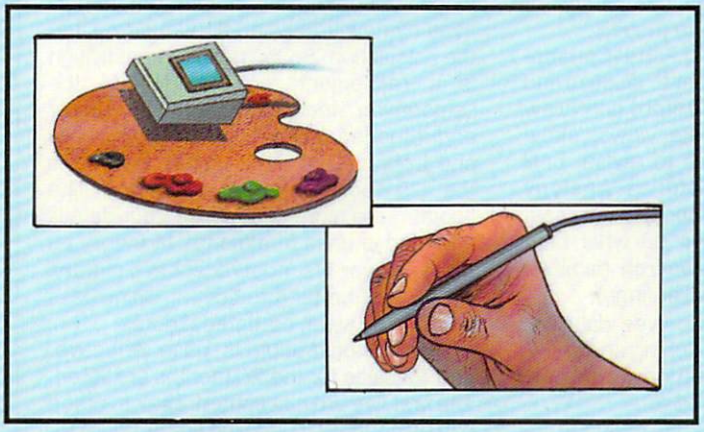

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WHETHER or NOT...

Peter McDonald looks at a 'golden oldie' a blast from the past, that may help you foresee the future

'Not for Lancastrians'

FORECASTER (C64:disk) is from Tryptych 1984, so it qualifies in computing terms as an "oldie".

FORECASTER claims to be "A simple yet versatile approach to prediction." What sort of prediction? Not quite for Old Moore or Nostradamus; more for market experts or politicians, or even you if you want to forecast trends.

FORECASTER's manual (or some of it) really should be read first. It is not practicable to load the program, pick an option from the MENU, and have a stab at it. The manual might well sort the men from the boys. That is not a criticism. It sets out to teach; its approach is thorough, and what it says, it says clearly.

For instance, the first MENU, as the manual records, offers these options:

1. **Basic Time Series**
2. **Advanced Smoothing**
3. **Simple Regression**

Of course, some people already know about these things. As the manual says, the program addresses three classes of persons:

a. **Those who understand the principles of forecasting and simply want to apply them (turn to Chapter 9 for applications)**
b. **Those who understand the concepts but don't know how to put them into practice (turn to Chapter 1) and**
c. **Those starting from scratch (start with the Introduction).**

The Introduction explains the two basic types of forecasting: quantitative and qualitative.

To give a simple example, to forecast next month's sales, you could take the numbers sold in preceding months, and draw conclusions from them. Or you could study factors which may have influenced sales (e.g. advertising; seasonal variations; price reductions). Or you might use one but modify it by introducing elements from the other. Thus you would be basing assumptions on numbers sold (quantitative data) and why you sold them (qualitative data).

These two methods are also known as (i) time series and (ii) casual model. In both cases you must collect data, develop a formula to produce a prediction, assess its accuracy by applying it to known facts, modify it if necessary, re-test it, and finally use it for an actual prediction. However, for the casual model you have to decide, before you collect the data, what sort of factors **might** influence the result.

You can do this by using **Panel Consensus** (bring experts together to discuss and produce a group view); **Delphi** (interview experts separately, collate views, show results to each, ask each to revise, until consensus emerges); **Historical Analogy** (look for similar circumstances in the past and base your prediction on what happened then); **Market Research** (familiar; but too expensive for smaller firms).

Any program which receives data and processes it, sorting, matching and showing correlations, is in essence a database, whatever its ultimate purpose.

If FORECASTER is, in essence, a database, it suffers from one disadvantage compared with others. In their tutorials, they nearly always use names and addresses as data for a sample program. That is convenient. Most people have ready-made data in their address-book. That sort of data is no aid to forecasting. Yet it would be a great bore if one had to collect a mass of data before working through an example. So FORECASTER provides some make-believe data. This consists of monthly sales figures relating to two categories of goods: TV sets and Microwave Ovens.

The manual warns you to have paper and pencil handy, and preferably a calculator! Demos on the screen produce scatter diagrams based on the 20 months sales of TV and Microwaves. (A scatter diagram is a graph with the points shown but not joined. Sometimes it is more eloquent than peaks and valleys.)

The next example is of ordinary averaging. Sales of TVs for 20 months are totalled and the answer is divided by 20 to give an average. You must then calculate the average for Microwave sales. You can't be bothered to add up 20 figures? Well guess a figure. A message (unless you are a genius) will say your answer is incorrect, but give the correct one. (I guessed; and was 60p out!)

Ordinary averages are not reliable. The longer the period, the more old (and perhaps by now irrelevant) figures creep into the calculation. So the next demonstration is a refinement; an example of the "smoothing" technique mentioned earlier and intended to iron out irregular peaks and troughs. The first, simple, method is the "5 point moving average". The "points" are months because your data is provided in units of a month. In theory an average over the most recent five months will give a better prediction, being less affected by stale, outdated, figures.

The demonstration is quite effective. The TV sales for the 20 months are listed. The first five are highlighted. Their average can be contrasted with the actual figure for the 6th month. You can cursor the highlighting down the list and test the accuracy of this method over the period.

You can then try your own hand on the Microwave sales figures. This exercise seemed non-productive. The principle of averaging over five months is obvious. So why keep on totting up five three-digit numbers and then dividing the total by five to get the average?

The next principle is "exponential smoothing". This uses only two factors (i) the forecast from the previous period and (ii) the actual for the current period. Pausing there, one can see that by adding together the last forecast, plus the actual, one is in effect adding (i) the forecast and (ii) that forecast adjusted for error. If one then divides by two (to get the average) the error is halved in making the new forecast. This produces a continuing refinement.

continued on page 47

continued from page 40

Please use a dictionary when you prepare the manuscripts, as I feel, these many spelling errors cause the appearance of CCI to go below "The Sun" (newspaper).

Please accept this as a constructive criticism.

Yours faithfully,

Martin Shaw (15), Stoke-on-Trent

Dear Martin,

It is not so much that we make spelling mistakes but that typographical errors creep in between the typesetter and us. Of course, they should be checked but sometimes – to often – they are not picked up at the proof-reading stage.

However, from now on we are using a different system – typesetting directly from disc through a form of desk-top publishing. So there should be far fewer mistakes. If there aren't – blame Nabcy Picard, she's the one in charge!

Thank you for your constructive criticism. (Glad to have helped you to win your bet!).

Dear Sir,

Since the Amiga has come on to the market CCI seems to be 50% 64 and 50% Amiga.

I am a C16 user and enjoy CCI very much but I like others would like to see some write-ups on games for the C16, +4, i.e. cheats, etc. There are a lot of people out here with +4s and 16s who buy CCI in the hope that there is something in there for them. I hope you will understand our concern.

Thank you from a regular CCI reader.

Clive Powell, Llanharry, Glamorgan

Dear CCI,

Nowadays, the C16 and Plus 4 hardly get a mention anywhere, I know you are doing all you can to get as much information as possible on these Commodore babies.

I have in my possession useful information for your readers. I have a list of over 500 programs for the C16 and Plus 4. I am also in the process of setting up a user group for the C16/Plus 4.

If any of your readers would like the information I have then could they contact me, D. Edwards, at the address below. Please emclose 20p and S.A.E.

All the C16/Plus 4 owners should stick together and keep our machines alive. Thank you for your time.

Address: 28 Central Avenue, Chadsmoor, Cannock, Staffordshire WS11 2JW.

Yours faithfully,

D. Edwards, a loyal C16 and Plus 4 owner.

Dear D. Edwards,

You are absolutely right. C16/Plus 4 owners should stick together and keep your machines alive. It shows a lot of initiative on your part to set up a users' group. Good luck with it.

Dear CCI,

I was somewhat taken aback by your reply to my letter regarding biorhythms. While I agree that scientists don't claim to have the definitive explanation for anything, we have to make decisions on the probability of something being true. The probability that the Earth is round is very high. The probability that the sun will rise tomorrow is very high. We have the scientific knowledge to predict or be 99.999999....% certain about these things.

Similarly with biorhythms. We do have the technology to calculate in a data bank of 112,560 accidents whether more than a chance number occurred on so-called critical days. To suggest that with our present level of scientific verification we cannot test the validity (or probabilty) of suggesting that we cannot calculate with any certainty how many of those accidents happened on a Tuesday.

Comparisons with current knowledge of physics and medicine compared with one hundred years ago are not really valid. In turn I could mention N-Rays and Polywater as comparisons. But I will not. Besides, your use of acupuncture is somewhat premature. Its Western practitioners seem reluctant to prove it scientifically. And the Chinese are giving it up; not for the first time. I wonder why!

I look forward to hearing from you.

Yours sincerely,

Mike Hutchinson

Dear Mike,

Yes, the probability of the earth being round is very high but the probability of biorhythms being real is neither high nor low – it is as yet unknown – as are many areas of more familiar human experience.

The key to scientific proof is predictability and replication. If, with statistical evidence you can predict the probability of an occurence and if, under precisely the same conditions as the original you can exactly repeat a result, then you have what is accepted as scientific proof. But because you cannot provide scientific proof does not mean that something is not true, or effective or even exists. We do not know, for example why aspirin works. Its results certainly cannot always be replicated. But aspirin is prescribed by doctors of medicine and often works. One day we may know why. There is in philosophy a premise that for something to be true it must be able to be 'falsified'. Neither you nor anyone else can 'falsify' biorythms because we do not know why, how or even if they work. For some people they undoubtedly do. And as for acupuncture. That's a poor example to choose. Not only has its efficiency been validated (Ask the western doctors who have witnessed operations using acupuncture instead of anaesthetics in China) but even hardened and sceptional CCI staff have tried and found it works. Never mind that it hasn't been scientifically discernable why acupuncture does what it does, remember what Saint Just said 'The disorder of today is the order of tomorrow'

Dear CCI,

Because your magazine is "international" it would be convenient if you could print the current Rate of Exchange for the countries you circulate your magazine in.

Almost all of the Mail Order Advertisements in your magazine are based on the £. This makes it difficult for those of us who think in terms of American $. A price guide would be most helpful!

The price of your mag in the U.S. is $4.50 U.S. Dollars. There are many magazines in the U.S. of similar (or better) quality that I can buy for only $2.00. If your price wasn't so high you would sell a lot more!

I hope you consider my suggestions, Thankyou,

Aaron Bluod,

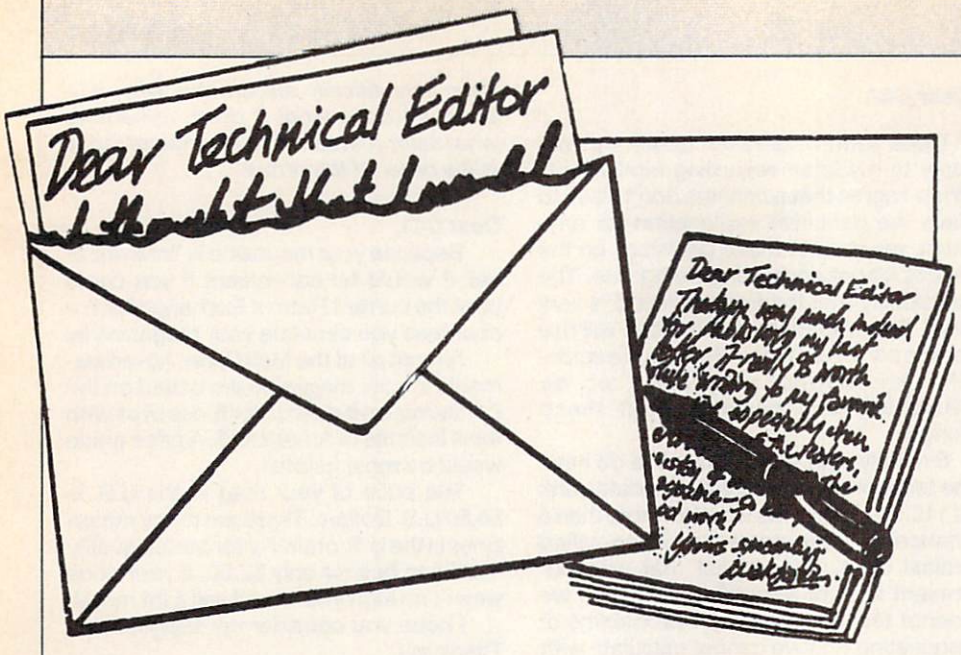
Florida, U.S.A.

P.S. A response would be appreciated.

Dear Aaron,

We have had many unusual letters in our time, but yours is certainly different to any we have had before.

CCI goes to some 60 countries worldwide including, of course, the U.S.A. and even Russia – where one of the major libraries has a subscription. For us to include the current exchange rate for all of them would turn us into a Financial Times or Wall Street Journal! One of the problems is that these days exchange rates see-saw so quickly that a monthly magazine would always be out of date. But we can tell you that the dollar/pound rate remains roughly the same, give or take a few cents at $1.75 to £1.50; you can work out the cost of mail order without too much trouble. However, it may not do you much good for our experience has been that prices in the U.S. are generally lower than in Europe. As for your point about our $4.50 price in the U.S., we have no control over retail prices outside of the U.K. The price includes the substantially greater transport costs but it is up to the American distribution channels what price they want to charge. We would be happy to keep the price down and sell more! Possibly the way around this is to take out a subscription and get CCI sent direct.



Dear Technical Editor,

I am the proud owner of a C64C and have been for some time, although I only use it as a games machine I must admit.

My problem is I think quite common, but being fairly new to your brilliant mag I would like your help all the same. When loading some of my cassettes in the past and come up against a fault I usually sent the items back but recently have found I taking longer to be returned or not having the particular game still in stock much to my dissapointment so to my question.

On putting a game through it loads the screen but then after loading the screen goes black where nothing seems to shift it the games seems to be locked. The only way to get back to normal screen is to switch on and then start again. I'm an invalid and usually wait for all the popular games to come out on compilation and more often than not, 1 game follows that criticism. Now there is bound to be some out there who say whats one game, but the law is (you know the law that states if you buy a compilation for 1 or 2 particular games then they're the ones that will cause the problems) sods law.

Is there a particular program that can be loaded to prevent this annoying problem, the one game I'm having problems with at the moment is (Tau Ceti) by CRL who for some strange reason seem to be the worst culprits with this snag. They are very quick in answering but I would like a short cut if possible.

Yours,

J M George, Aberdeen

P.S. Keep up the good work on an above average, excellent magazine.

Dear J M George,

If the replacement tapes load and play alright then the fault would seem to be mainly in the original tape.

The pratical thing to do is to make sure that your tape deck is cleaned at regular intervals, and that alignment checks are also made, both depending on the usage of the deck.

This should ensure that any tapes you receive that are borderline recordings have the best chance of loading without errors.

Borderline tapes would be those where the duplicating studios own equipment was nearing its own time to be cleaned and adjusted.

Dear Technical Editor,

I am fairly new to computing but I came across an idea while looking in a video magazine which advertised titling of V.H.S. video's and the charge of this service was around £5 per tape up to £10.

But it can be done on a C64 which is the computer I own, for around £4 which is the price of the leads needed.

The leads needed are a DIN socket into 2 phono female sockets also 2 phono to phono leads and also the socket for the sound is a 2 phono female into an ear socket which fits a standard Cassette Ear Socket. All can be purchased from an electric store.

The DIN socket fits in the video socket of the C64, 1 socket is connected into the female of the DIN phono the other end of the phono lead fits into the video in socket on the video. If sound is required as well connect the other phono into the video audio socket and the other end into 2 phono female to one ear socket (fig 3) and te ear piece socket into a cassette recorder to play your music from or if you require sound from the computer just take the phono out of (fig 3) and attach to the spare female phono socket on the DIN (fig 1)

The video has to be set to auxillary for input devices, if you have no cassette recorder, a walkman or Radio Cassette will d.

When all is connected turn on your T.V. or monitor and tune in till you get the computer display and you can type in what you want or you can use any mouse, lightpen, or graphics pack.

Once you have type in what you want put a video cassette into video and press record.

With experimenting you can achieve some professional results, it can be used to put your name on video cassettes ot titles on wedding videos to add a professional touch.

I hope readers will find this useful if not fun, if anyone has any problems with this practice, I would be glad to answer any queries but please enclose an S.A.E,

K Atkins
42 Bexhill Avenue, Greatfield Estate
Hull

Yours sincerely,

K Atkins

Karl gives some help for 64 users interested in video titling. I have not verified his setup but it sounds a useful idea.

No soldering or rewiring is required and therefore if connected correctly with equipment power off and connections as shown, then no damage will result.

Dear Technical Editor,

I am an owner of a VIC 20 and 32K RAM. I am writing to you because I wondered if there is a poke to Jetpac (Ultimate) and The Perils of Willy (Software Projects).

P.S. Do you know anywhere which sells VIC games.

Yous faithfully,

Nick Williams, Bucks.

Dear Nick,

Over to our readers for their answers to your game querie. For VIC 20 software try AUDIOGENIC (SUPERSOFT) on 01-861-1166

Dear Technical Editor!,

Could you please help me!!! I have a 'Commodore 64' and I want to learn its 'BASIC' Language! Is there anywhere I can get lessons to become well known to the language enough to be able to wirte games!!!? If there is, how much are the lessons?, please help!. Thanks.

Yours sincerely,

Ian Markey, Gloucester

Dear Ian,

I have a few suggestions.

1. Put a free advert in our classifed column for someone in your area to contact you with prices etc.

2. If you are eligible for a college of Further Education then try your nearest ones for computer programming classes.

3. I recommend buying Rae West's book 'Programming the Commodore 64' Available from Biblios Distributors Ltd. Star Road, Partridge Green, Near Horsham, West Sussex RH13 8LD. Phone 0403-710971

This book has 611 pages and contains the following sections which are relevant to your needs.

Basic reference guide; Effective programming in Basic which includes 'How to become fluent in Basic'; Program Design; Serious and less serious programming; 'Debugging Basic programs' and much more.

continued on page 48

COMPUNET

First the bad news, the cost of using Compunet has risen by fifteen percent. It has always been a foundation of the Vritish constitution that information should not be taxed and thus newspapers and books do not attract Value Added Tax. For the same reason online databases such as Compunet and Prestel have remained tax free.

Unfortunately due to a ruling by the European Court of Justice VAT now has to be levied on subscriptions to online services. The connect time charges, fees based on the amount of online time used, are similarly increased. Compunet, Telemap (who run Micronet-800), and a variety of other online services companies are cooperating to raise an online petition against the levy. It has been suggested that this is the first time that Compunet and Telemap, normally jealous rivals, have ever agreed about anything!

Compunet's Standard subscription has now risen to £13.80 a quarter and off-peak connection charges now accumulate at £0.92 per hour. Compunet 'Gold' users pay £32.43 a quarter but receive a number of extra benefits including off-peak usage free of connect time charges. Because Compunet charges are based on elapsed time, rather than the number of packets of data transmitted, it pays to dump data to disk while on-line and read it later at one's leisure. Used with some thought Compuet still provides a remarkably inexpensive service.

Compunet's database is growing at such rate that it has once again become necessary to increase the host machine's disk space. It's growth rate has also meant that its simply not possible for a single user to keep an eye on all areas for interesting uploads. Various attempts at providing a news service covering new uploads have been made in the past and the latest, based on new Compunet software and a dedicated team of users, is the most succesful to date.

Reading REVIEW is a good way of finding areas of the database, both old and new, that one hasn't come across before. Another way is to download METNET's Compunet Index (GOTO INDEX). This contains brief details of the contents and status of each of Compunet's main directories. There are over six hundred and fifty such areas covering every conceivable subject.

Two of the most interesting areas on the system at the moment are CODE and CNETX. Between them they give a lot of technical information about how the Commodore C64 and Compunet host machine communicate. There is even a detailed memory map of the C64 terminal code along with hints on how to add new features and commands to its menus.

Most users use programs such as Quartz and Plus to enhance the C64 terminal software by adding facilities such as access to the CBM DOS, extra editor buffers, enhanced editor commands and the automation of commonly used functions. In fact the standard Amiga Terminal software falls behind the standards of power and ease of use set by the enhanced software being run by most C64 users. As agreed when the Amiga was introduced to the Net, Ariadne Software have released the Amiga Terminal source code (at AMIDEV) so that users can add their favourite features. Not to be out done, developers of the eight bit machine are busy adding features introduced with the Amiga software, such as bar charts showing the progress of file downloads, to the C64 code.

Next month CCI interviews Peter Hardcastle, known on Compunet as NETFAX. As Compunet's new editor his is the task of guiding the system through a period where it is expected to see many changes. With the system opened up to Amiga, ST and soon PC owners, he will be responsible for restructuring the databse without losing any of its unique qualities.

J.M.L.

WHETHER or NOT...

continued from page 22

For example, let us say that the first forecast (based on a "5 point moving average") was 250, and the actual was 275. The total is 525, so the average is 262.5. That would be the forecast for the next period. Let us imagine that the actual figure for that period was 300. The next forecast would be 281.25, and so on.

But the method given in FORECASTER is, of course, more subtle than that. It introduces a formula to increase accuracy. The formula is:

New Forecast = (1-A) × Old Forecast) + (A × New Actual Value)

In this formula, A can be varied within the range 0 to 1. It reflects the type of averaging. Make it less than 0.2, and simulate a moving average of 5 or more points; if larger than 0.5 it resembles a moving average with only two points. So let us use 0.1. This (using our examples of 250 and 275) produces this:

New Forecaste =	**(1-0.1) × 250) + (0.1 × 275)**
or	**(0.9 × 250) + (0.1 × 275)**
or	**225 + 27.50**
or	**252.50**

It will be argued that this gives a less accurate forecast than simple averaging as illustrated above. That is true. But I am merely illustrating the difference in method. Forecasting is based on the assumption that there is **some** correlation between what has happened in the past, and what will happen next. "Exponential smoothing" tries to detect that correlation and produce a more accurate forecast. But no system can detect meaningful correlation in arbitrary figures, picked at random for a tutorial.

That shows the difficulty of testing FORECASTER. One has to use real data, or put into invented data some artificial correlation, to see if the system spots it.

You should now know if this program appeals. If you are determined to learn forecasting on your computer, FORECASTER is for you. It is clear and methodical, and there is nothing shoddy or half-hearted about it.

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If you study this book carefully and have the necessary imagination and ability to design games etc. then this book will help you considerably.

Dear Technical Editor,

I have a Computhink disk drive model No. DKH 642-1. Can it be used with a Commodore 64.

If so what is the pin configuration as I do not have the leads for the unit,

Yours Sincerely,

David Thompson, Cumbria.

Dear David,

The Computhink disk drive could be used with a 64 provided you have the necessary interface (probably a standard RS232 connection to CBM type RS232)

I do not have the pin configuration but you can try Meadmore Ltd on 051-521-2202 for a suitable cable.

If you have the Computhink manual then you will realise that these drives have limitations as compared to Commodore drives.

I doubt if many commercial programs will work because of their being designed for normal drives.

Dear Technical Editor,

I have been a Commodore 64 user for about 3 years now and I would like to upgrade to an Amiga 500. I'm going to buy in the UK and I would like to know whether I will be able to use it in the USA. I have seen adverts for A500 power supplies. If I replace the UK power supply with an American one once I get there will I be able to use it then, I understand that I'll be needing a new TV modulator, is that true? Thankyou for any information.

Yours sincerely,

Mr A. Heidari, London

P.S. Please help me.

Dear Mr Heidari,

A500's and accessories etc are much cheaper in the USA and therefore you will be better off waiting until moving there before buying.

All that needs to be changed if you do take a UK Amiga 500 with you to the USA is the power supply unit. Their system being at 110V.

Dear Technical Editor,

Referring to an Ad in your magazie of an Okimate 20. My son has bought a Okimate 20 Thermal Printer here in Auckland, New Zealand, but it does not work on an Amiga 500 computer.

It has a personality module which we think is a standard Parallel but the Amiga needs an IBM Parallel and printer cable. Having no success in Auckland, would it be possible to purchase one from you or could you kindly let us know who we can purchase it off,

Thanking you kindly,

Yours faithfully,

Mrs Carol Buswell, New Zealand

Dear Mrs Buswell,

Try Lan Computer Systems 1063 High Road, Chadwell Heath, Romford, Essex, UK.

They have an Export Hotline on (01)-597-8854 or TELEX 995548. FAX on (01)-590-6057

Ask for Trade Dept. Major credit cards accepted for orders.

Dear Technical Editor,

Perhaps I am able to help B.C. Richards a little bit with his/her problem. I enclose some nformation about usage of the REU.

Besides, I want to recommend usage of GEOS in its new version 2.0, which is rather (more) professional. I myself own additionally to my C64 a REU (the 1750 which has double the capacity of the 1764 and is also usable for the C64 though outlined for the C128). Furthermore a 1541 and (very recommendable for file work, less for original software to start) a brand-new 1581 (3.5" disk drive). My printer is the STAR NL-10 with Commodore interface.

Since GEOS is not kid-stuff anymore, I personally am very glad to own AND use GeoWrite 2.1, Geopublish and Geomerge. Rather professional programs. For B.C.Richards Geofile and Geocalc might be of high interest as well. Easy to use, very flexible and by using the REU 1750 combined with the 1581 drive (and the 1541 to start the system) a really mighty system with a high capacity for lots of data, suitable for business.

You are allowed to give my name and address to B.C.Richards, thus he will be able to contact me, if he has further questions. I would be pleased to reply to them.

Hoping my lines were of any help for a collegue reader (or even more than one), I send my kind regards,

Yours sincerely,

Ronny Sinkgraven, West Germany.

Dear Technical Editor,

I have a Commodore VIC20 with 16K RAM pack. Knowing fine well that this system is well out of date, however I thought it might be useful to introduce my 5 year old son into computing. The problem being that I do not have any software tapes and can not find any outlets still selling VIC20 software.

Could you please help i.e. any names and addresses would be most welcome.

Also could you tell me if there is any way in which my VIC20 may be upgraded by use of expansion boards etc.

Yours faithfully,

Mr M Foreman, Cumbria

Dear Mr Foreman,

Again try Supersoft on 01-861-1166 and it is possible they may have some expansion RAM, whether cartridge or on motherboard remaining in their stocks.

Dear Technical Editor,

My son and I have just finished entering CRIB-128 into our computer from the Dec and Jan 1987 editions of C.C.I.

It has taken us this long owing to 'one-fingered input', moving house and an 'over 40' brain.

However, when finished, loaded, and run, the only thing we can obtain is line-/data error 6990.

Neither myself or my 13 year old son have the faintest idea of what to do next to get the programme running. I have enclosed a copy disc, and the relevant pages from the program.

Please can you help?

Yours hopefully,

G.M. Stead, Pudsey

Dear G.M. Stead,

There are many errors in your program listing.

The one that caused the line/data error in 6990 is the extra comma at the end of line 400.

The program interrupted this as another character will follow, in this case a null.

This displaced the DATA READ in by one and resulted in the wrong data items being READ in line 6990, and display of the appropriate error message.

There are many more typing errors such as in 710, 720, 810, 900, 1030, 1050, 1150, 1200, 1360, 1670, 1740, 1750, 1970 and many more too munerous to list in full.

A commom error is the listing of a figure '1', when it should be 'l'. Each line myust be checked after entry.

The procedure is to enter the line and then press RETURN and then LIST the line. Check carefully and then repeat.

SAVE the program at frequent intervals, say after every 10 lines entered.

To computers every character is significant, whether a letter, figure, comma, colon, semicolon, space, full stop or whatever.

Thus the extra comma in line 400 throws the entire DATA READ comnination out of sync.

There are also missing closing brackets and such like errors.

If after running the program it crashes at some point then there will be an error message and a line number so that you can correct, resave and then run.

The program does suffer from lack of 'on screen' instructions as to which keys to press.

You have to guess and this is not the best programming style.

In line 230 DK=1 is correct for disk users, but you had DK=1 interpreted as DK=0 at that point!

One correction to the program appears to be in line 6650 which should be altered to IF DA<0 OR >255 then 6990.

Another type of error by you is in line 620. The character should be 0 not O (figure not letter), and retype the rest of the line.

Lines 3270 and 3280 are identical REMS so that 3270 should be retyped.

I hope the above comments will help other CCI readers when typing in our program listings.

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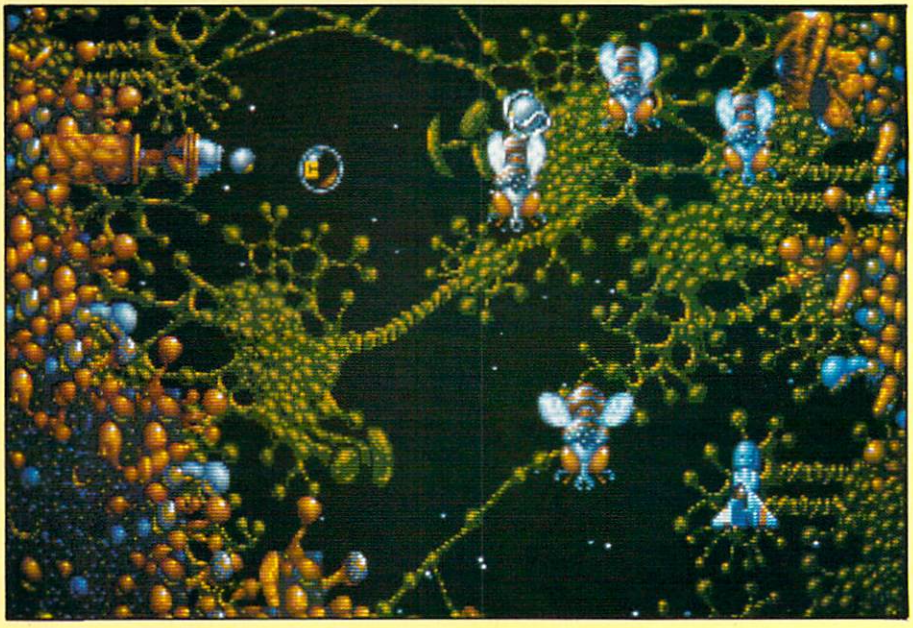
Heard It On

You see the old faithful name of Mirrorsoft cropping up all over the place these days. They are consistently notching up Chart toppers with their own or associated label products. Recent winners like Dungeon Master, Falcon and TV Sports Football have all been out of the Mirrorsoft stable. And keeping our ear to the ground (which is a bit uncomfortable when you are trying to stick your eye in the keyhole at the same time!) we have captured some whispers that are going round the grapevine on some of their future releases which may have an even bigger impact still in the not too distant future.



Imageworks

Mirrorsoft's hit new label which distinguished itself after its recent launch with the likes of Foxx Fights Back and the highly acclaimed Speedball has a whole bunch of hot-looking goodies about to arrive on the games scene.

Leading the Imageworks pack is Xenon II. Yes, you no doubt remember the great Xenon came out from Melbourne House. Well, the follow-up written by the same Bitmap Brothers (also of Speedball fame) is from what we have seen and heard likely to set new standards in the arcade field. This is one that you must watch out for. But there is more from Imageworks like Interphase.

Interphase is set in a future time where people fill their substantial leisure time not with videos or video games, but with Dream Tracks, recordings of fantasies and pleasurable experiences, which anyone can plug into and actually experience for themselves.

The whisper is that Mirrosoft are saying that Interphase features the fastest and smoothest 3D filled vector graphics yet seen, intriguing computer logic puzzles, and some of the most dazzling flight and fight sequences ever to be experienced on a home micro.

There is also Crime Town Depths. The buzz is that on this one the graphics are merely sensational. And Phobia, programmed by Tony Crowther with a design by David Bishop where instead of mindlessly shooting everything in sight the player must negotiate nine of fifteen Phobia planets which are really incarnations of human phobias from spiders and snakes to enclosed spaces and dentists. Not one to play alone in the dark night ... There is word too of an RPG with two player option. The setting for Bloodwych is a large and rambling castle with a labyrinth of tunnels, strange inhabitants and dark secrets. The castle holds the key to absolute power (Editorship of CCI?) with four hidden crystals. (They are all the rage this season!)

Bloodwych

DDT too. No, it's not a pesticide that you have to wash off apples but another game with some eyesearing graphics and plenty of arcade action. We hear that Mirrorsoft's own description of it is "A bi-directional horizontally scrolling platform game with shoot 'em up and arcade adventure overtones and cartoon-style humour." That will teach us to listen in to conversations we don't understand.

We also believe that they are working on something called "Paladin, Lord of the Dancing Blades" (no relation to the game we recently exclusively reviewed also called Paladin, we hope.) No details of that yet but, watch this space ... (Dancing with a blade could be a cutting experience!).

Mirrorsoft also represent Cinnemaware in Europe and they are rubbing their hands with anticipation that Bob Jacbobs' crowd are going to come up with a winner to follow the

present number one in the 16 Bit Chart, TV Sports Football. It isn't yet one of the further sports like basketball that we hear are slated to follow on the series but a successor to the great Defender of the Crown (you read about it first, of course, in CCI). This one is called Lords of the Rising Sun which is whispered as Cinemaware's most ambitious project yet – and that's from the creators of the marvellous Rocket Ranger! "Lords" is set in 12th Century Japan in a Civil War. Action takes place in realtime with changing seasons and weather. It is played on three-screen wide map of medieval Japan with enemies that move in realtime too. Not so nice is the idea that if you fail to redeem the family honour you are forced to commit hari-kari, yes, that is ritual disembowellment. Ouch!!

FTL

We can reveal to you that the highly successful Dungeon Master is not going to be released for all you unexpanded A500 owners. FTL, also represented in Europe by Mirrosoft, sold plenty of DM to 1 Meg Amiga owners but have just not been able to come up with a suitably compressed 512K version. So, rather than put out something under par they have simply abandoned the whole thing. But they are going to be brining out some extra levels of Dungeon Master itself with a new released called "Chaos Strikes Back" which should make a lot of RPG fans – and they seem to be growing all the time – very, very happy.

PSS

Among the little known facts that you weren't sure you wanted to know in the first place is that Mirrorsoft owns PSS. Who he? Second "Little known fact etc" PSS is the largest U.K. publisher of wargames for home micros. Well, we hear, that among other things like jazzing up its whole image, PSS are jumping into the 16 Bit bandwagon and are also going to jazz up its games. For most people that won't be a bad thing because wargames are not your everyday games player's usual choice. (No doubt I will get thousands of letters of protest led by the redoiubtable Rainer Gellert and his girl friend!).

Anyway, PSS are planning to release Waterloo which they are bubbling about being the closest representation of the battle ever to appear. Has any ever appeared before?

To satisfy your sadistic or masochistic tendencies you will be able to play either Nelson, sorry, Wellington or Napoleon. The whole thing has been meticulously researched to make it as historically accurate as possible. PSS are also bringing out a 16 Bit version of Theatre Europe, which was highly successful on the 64.

Spectrum Holobyte

Who? I hear you cry. (Do I?) Let me whisper in your shell-like ear the magic word "Falcon". Now does Spectrum Holobyte mean anything? Yes, they are *the* people, a company who produced what some think is the greatest entertainment ever on the home computer screen. It has probably sold more than any other 16 Bit flight simulator and picked loads of awards on both sides of the Atlantic. Well, we have heard that Spectrum Holobyte, a sister company to Mirrorsoft in the U.S. have decided to prolong the life of Falcon by releasing a series of "Mission Disks" They are a neat idea which will let you replace the Disk 2 of the original Falcon with twelve new missions on another disk. No doubt we shall see Mission Disk 3,4,5,6, I expect you get the idea and Spectrum Holobyte get the money. Well, of course they are really only doing it for your enjoyment ...

Whatever happened to the sleepy old Mirrorsoft? With all this hectic activity through the pile of labels with which they are linked there should be lots more whispers – even shouts – about them down the grapevine in the coming months. If you want to know what's going to go on, listen in to this space!

Z.M.S.

The Grapevine

Xenon II

Phobia

With their endless stream of variations on a 3D theme, it looks as if Titus are making a bid to become the Sega of 16-bit games. So far their attempts have fallen short of the mark, but with the sequel to Crazy Cars they are at last getting their act together.

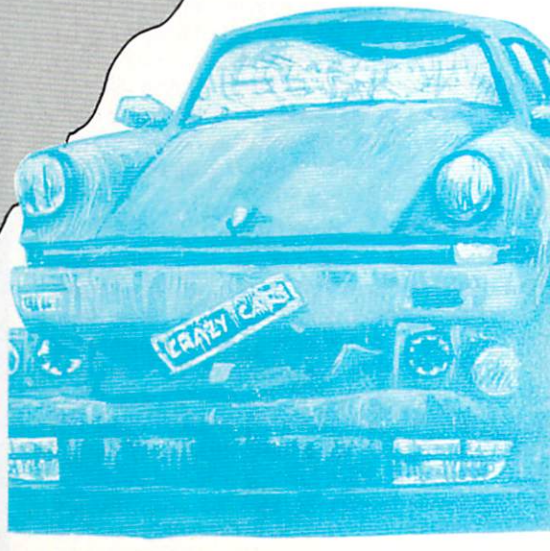
The plot is a bit hazy. Your mission is to break up a stolen car racket run by corrupt police. You devise a plan that entails driving your sleek Ferrari F40 at speed through four American states. How you intend actually putting a stop to their dodgy dealings is unknown, you just concentrate on getting across those state borders.

Before you press your foot to the floor, it might be a good idea to take a look at the map and plan a route. Then again, it might be a waste of time, as there are so many roads on the map it is almost impossible to relate it to the road ahead. Fortunately some handy LEDs on the dashboard indicate the best route as you approach any junctions.

If you are at all familiar with Titus' previous games, the first thing you will notice as you pull away is the improvement in the 3D graphics. Before, speed was only accomplished at the expense of smooth animation, but that is no longer the case. Although it cannot match the brilliant Super Hang On in this respect it still marks a substantial step forward.

"...cops do their best to cut you up and run you off the road, and as your Ferrari explodes at the slightest contact they are to be avoided at all costs."

The road starts off as a standard three-lane highway flanked by short posts and telegraph poles with connecting cables. Soon enough you hear the menacing whine of the police siren. These cops do their best to cut you up and run you off the road, and as your Ferrari explodes at the slightest



Crazy Cars II

Titus

change in the scenery.

One thing Crazy Cars II has over every other race game on the Amiga is a very solid look. What is does not have is real bite. It could do with something extra to set it apart from the rest, perhaps a more definite mission. I can see some may be put off by the tricky controls and the price, but if you can live with that, Crazy Cars II is worth a try.

T.H.

contact they are to be avoided at all costs. The steering is joystick controlled, but the programmers have made an attempt to make this proportional. This makes the car extremely difficult to handle at first, and you will find yourself veering wildly from side to side as you constantly over-steer. The small steering wheel icon in the corner of the screen helps, and with practice you learn to sweep around the cops in one piece.

Slip roads offer possible short-cuts but are very narrow and lined with more of those nasty little posts. Night falls for a short while further into the game, and with each new state you get a slight

Graphics: 70%
Sound: 68%
Playability: 70%
Value: 65%
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HORGAN'S HINTS

Wow! I've just realised I can run the Wild Copper music demo and my word processor simultaneously! Technicolour scrolly messages and obscene icons whizzing across the screen certainly spruces up the system, and then there's that get-down-boogie soundtrack to type to. I bet you lot have a few posey demos kicking around. Maybe they're a friends, maybe they're your own. Whatever the case, I'd be interested to see any, 16 or 8-bit. I'm sure we can sort out some goodies for the better code contortions. Talking of goodies, I'll be taking a delve into the surplus sack for the best pokers, tipsters and cartographers of the month, kicking off with a bundle for Mark Goodinson's contributions.

64

Robocop

When this came in for review I must have spent as much time trying to work out an infinite energy poke as I did playing it!

Mark Goodinson comes to the rescue. Load and reset before entering:

POKE 44416,0
SYS 32768

Dominator

Sorry, no restart address for these, so it's for hack carts only.

Enter the following after resetting the game:

POKE 2215,234:POKE 2216,234 (infinite lives)
POKE 2542,0 (steer on all levels)
POKE 4499,2 (extra speed)

Pacmania

Poke the memory thus for infinite Pacs:

POKE 28520,165
SYS 14336

Operation Wolf

Load and reset before entering:

POKE 36007,165 (infinite energy)
POKE 35107,173 (infinite cartridges)
POKE 35103,165 (infinite bullets)
POKE 34952,165 (infinite bombs)
SYS 16960

Purple Heart

Load and reset before entering:

POKE 6466,173 (infinite lives for player one)
POKE 796,173 (infinite lives for player two)
POKE 19803,189 (for infinite arms)
SYS 3072

Oink

The first in a bunch of pokes for recent re-releases comes from David Dewar. Enter them after resetting the game.

POKE 39922,165 (infinite Rubbishmen)
POKE 47774,227 (infinite Tom Thugs)
POKE 31991,227 (infinite pimples)
SYS 16384

Krakout

POKE 35220,200 (infinite bats)
SYS 16033 to restart

Metrocross

POKE 13501,234:POKE 13502,234 (infinite time)
SYS 4096 restarts the game

Traz

POKE 42200,173 (unlimited bats)
SYS 32768

The Way of the Tiger

Reset and enter this listing to play back the title music.

Change the tempo by altering the 6 in line 30.

```
10 REM **DEWAR**
20 SYS 49152
30 FOR T=0 TO 6:NEXT T
40 RUN 20
```

Nomad

This one came from James Trinder as an addition to a four-page players guide to Project: Stealth Fighter, which was unfortunately too lengthy to fit in this month. Before you die, reset and type SYS 4096. Now all blasted things stay blasted, but switches are reset.

Ok, thats all for now. The address for those pokes and demos is:

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Tony Horgan.

Tony Horgan travels to the arcades, still the front line of the entertainment world, and reports on games you may soon see on your own screen.

Arcade Extra

Starring in your own Miami Vice car chases scene is everyone's dream, or so the leading coin-op producers seem to think. That old favourite, the car race game is as popular seem to think. That old favourite, the car race game is as popular as ever, and it's good to see that most of the machines are moving with the times. Of course there are the gimmicks, the hydraulic cabinets and flashing lights, but take a look further into the games themselves and you'll find they've had a revamp too.

When Outrun was at its peak, Taito released their attempt at a rival machine: Top Speed. It turned out to be a cut down, inferior clone with little to win over established Outrunners. Around

this rather tame basis they've built a far superior sequel. Chase HQ, now reported as the top attraction in Arcades in the U.K., casts you in the leading role of a scenario straight out of Starsky and Hutch. Your mission is to arrest a criminal speeding out of town in a stolen sports car. First you have to catch up with him, so to begin with the game plays just like any 3D racer.

When you do sight the vehicle you still have to stop it. The only way to get these mean characters to pull over is to smash up their car! "Oh man! One more time!" come the hoots of excitement from your partner as you ram the target off the road. Played in the deluxe version, its brilliantly absorbing and has you cursing and swearing out loud as you show the crooks who's boss. Ocean have scooped the rights to computer versions but it won't be on the shelves until Christmas.

Sega have finally come up with a sequel to Outrun, but it has to be said it's disappointing. As the name suggests, Turbo Outrun's main addition is a turbo button. You now drive the new Ferrari F40 instead of a Testarossa, and that's about the level of the enhancements throughout the game. Playing the original Outrun after this is a great relief, as Turbo's graphics are very messy and hard to follow. Not Sega's best by a long shot.

Moving up into the "quid a throw" bracket brings us to Atari's Hard Drivin'. Leaning far more to the simulation side of the car race

cont. on next page

continued from page 55

Arcade Extra

game, it goes all out for realism. Along with the standard accelerator and brake, the cabinet also houses an ignition key, an optional clutch and a four speed gearbox. The display uses filled vectors that move a little jerkily for a coin-op, creating a 3D enviroment with a touch more freedo than the rest. Keeping the car on the road is a lot more difficult than you wouls think. Memories of Revs flashed through my miond as I constantly veered from one verge to another. Take the stunt track and you get to loop the loop and leap across an open bridge. After a crash the salt for the wound comes in the form of a "spotter plane" view replaying the accident. Before you start it's a good idea to check which side the gearstick is on; right and left hand versions are available, so make sure you drive on the right side of the road! More economical substitutes, the home version, are on the way from Domark.

Sequels are another favourite; Double Dragon and Operation Wolf are a couple of past hits getting a second airing in a souped up form. Like many sequels, Double Dragon II is a little more than a harder version of the original with new graphics. The controls have been altered slightly, and you're likely to find it in one of the new super-sized cabinets, but that's all there is to it. Even the most proficient Double Dragon players will find their first batch of tens swallowed up in a matter of seconds.

Operation Thunderbolt is another mediocre follow up. The gameplay is a sgood as identical, but you now get the opportunity to pump lead simultaneously with a friend. Instead of rescuing captives, your job is to stop a band of terrorists running loose at an airport. The graphics have lost a good eal of their menace, and the rest of it did little for me, though I can see it providing an irresistible expense for Operation Wolf vets.

T.H.

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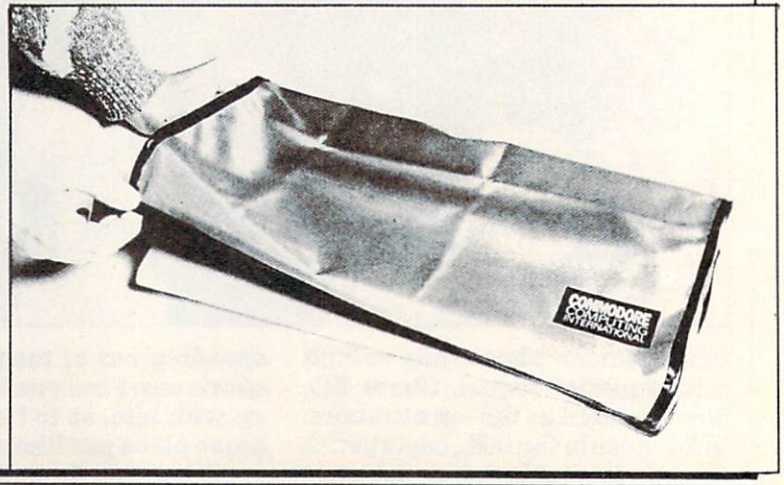

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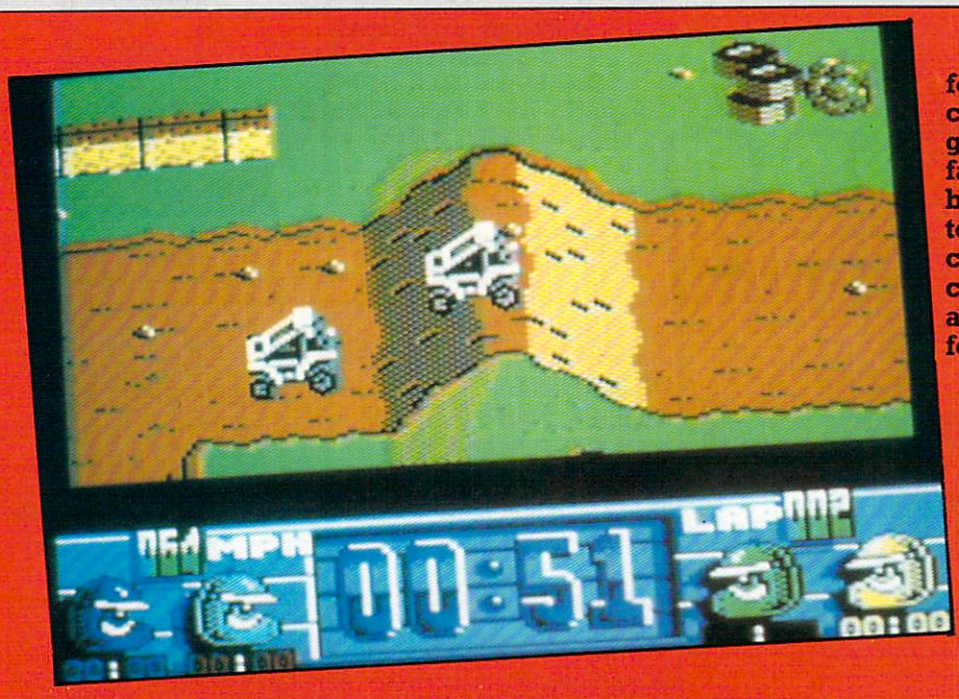


Run The

Presented by ex-Professional Martin Shaw, Run The Gauntlet has now become a regular feature of bank holiday and festive season TV. Someone was bound to buy up the rights for the computer game, and unsurprisingly that someone is Ocean, who specialise in the exploitation of TV and film properties.

Although the packaging boasts "nine explosive events" there are really only three: offroad racing, watersports and the hill. Offroad and watersports are stretched into eight events by giving you four different vehicles for each. At the start of the game the computer chooses three races, each made up of a random combination of the nine base events.

Hovercraft, speedboats, jet skis and inflatables are your possible modes of transport for the watersports, all differing in speeds and cornering ability. The course is marked by pairs of buoys that glow to indicate the next gate. You get the advantage of a faster boat than the two opposing racers, but they know the layout of the course. While the different vehicles only offer a very slight variation to each race, the programmers have done well in simulating the characteristics of each.

Offroad racing takes a similar form but is not confined to vertically scrolling tracks. Your biggest problem when driving the faster buggies is that of the tight bends. However, when you come to drive the slower "supercats", corners are easily taken, so you can hardly fail to win the race, and lapping the loser is almost a formality!

Combat School veterans will be familiar with the remaining event: the hill. This is a vertically scrolling assault course in the traditional stick waggling style. Between shorts bursts of pure waggling you have to negotiate walls, cross narrow logs whilst fighting off attacks from a water cannon, and scale a two-part climbing net. Good, if unoriginal fun in the short term, but then Ocean must feel entitled to it since they hold the home computer rights to the coin-op.

If you manage to come out on top at the end, you get a congratulatory graphic piece,

but do badly in any event and you risk elimination from the game.

Graphics standards vary throughout the game. The watersports feature minute but detailed sprites with a nice wake effect behind the racers, while the offroad racing is very plain with chunky sprites. Sound is uniformly bad during the whole game; the music is tuneless and the effects unexciting.

Run The Gauntlet should have made an excellent computer game. The decision to recreate the events as beefed-up Super Sprint variants puts it halfway along the road to success, but the realisation lets it down. Offroad looks very rushed and plays unrealistically, and the watersports are just a bit too slow to be exciting. With a split-screen two player mode and a smoother flow between game sections it would have been great, but as it is, Run The Gauntlet is disappointing.

T.H.

Graphics: 62%
Sound: 33%
Playability: 61%
Overall: 60%
Rating: IFFY
Price: £8.99(c)
£14.99 (d)

AMIGA

As usual, the most immediate differences in the 8 and 16-bit versions are all the extra digitised graphics and sounds. Martin Shaw's sampled voice opens the game, with a couple of digitised action men animated on either side of the screen. Gameplay is very similar but for one important difference: inaccurate collision detection. In a game where you are constantly trying to get the best line around bends, making precision maneouvers, pixel-perfect collision detection is essential. In addition, the computer racers always come out on top of any collisions. That aside, Run The Gauntlet is enjoyable, but extremely overpriced for what is an 8-bit game with bolt-on extras.

Gauntlet

Ocean

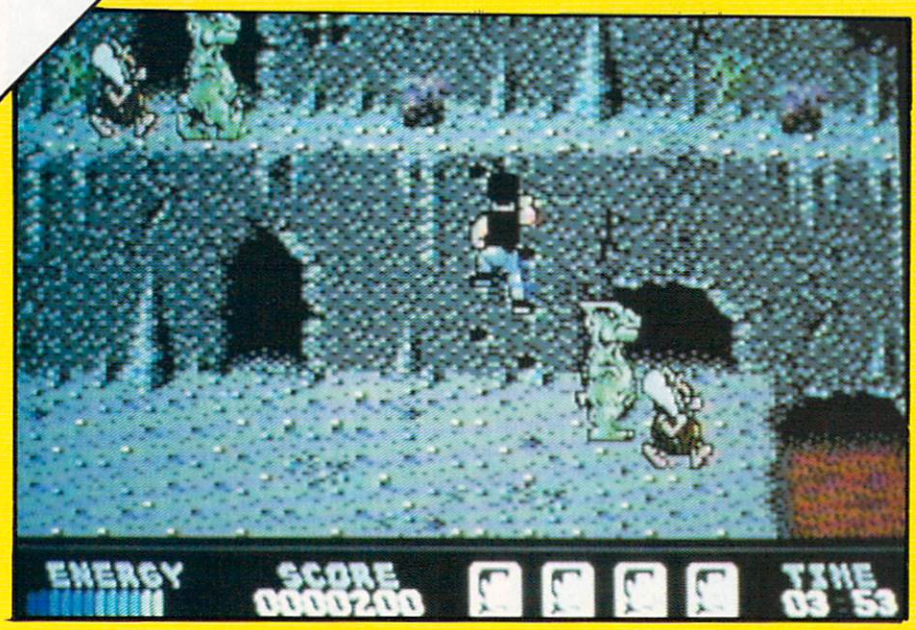
Graphics: 70%
Sound: 59%
Playability: 65%
Overall: 58%
Rating: IFFY
Price: £24.99

C64

CRISP

Imagine

Renegade III



After you fought your way through countless gang-ruled suburbs in previous Renegade chapters, those nameless captors kidnapped your girl once again. Unlike before, you are no longer punching your way from one side of town to another, but travelling through time in your heroic quest to rescue her.

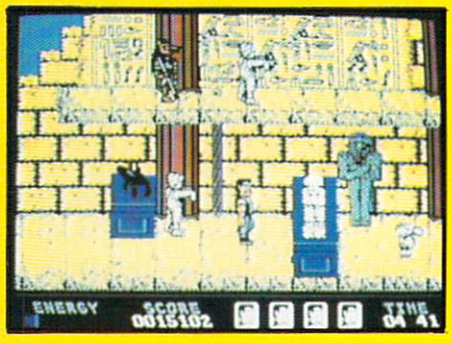
You begin your time travel in the stony days of dinosaurs and cavemen. Everyone knows the two lived in different times (if you believe everything the historians tell you) but combining them makes for an almost plausible real life Dungeons and Dragons style scenario. Renegade himself is straight out of the eighties, with blue jeans and a trendy waistcoat. He has brought along with him his favourite assortment of punches and a flying kick, amounting to five moves in all. Give them half a chance and the dinosaurs take a chomp out of your head, alternating with the club-swinging cavemen. Just like Dragon Ninja and Target Renegade, the screen scrolls from right to left, pausing for a short time at key points before moving on.

"Knights on hobby horses and jesters put the boot in as you make your horizontally scrolling way along the battlements."

With each level you find yourself projected further through time. Ancient Egypt comes next with mummies taking a leading role. Another trip through time and half way around the world puts you in medieval England. Knights on hobby horses and jesters put the boot in as you make your horizonatally scrolling way along the battlements. The 20th century flies past unnoticed in the next jaunt which ends up in a robotic future world.

Differences between the levels are mainly graphic; castle battlements replace Egyptian tombstones and droids follow on from dinosaurs. Ocean's usual high quality sprites give it an attractive look, though the multiplexing does glitch quite often. A familiar soundtrack adds very little to the game, similarly the effects are just more of the same.

There is life in the scrolling beat 'em up theme, as long as the programmers take a fresh approach. Coming from the team that gave us Target Renegade and Dragon Ninja it is hardly surprising that Renegade III plays, sounds and looks very familiar.



Followers of the Renegade saga will be the most interested parties, but also will have the biggest disappointment. Not that the game is bad, it just takes too small a step forward to be a worthwhile buy.

T.H.

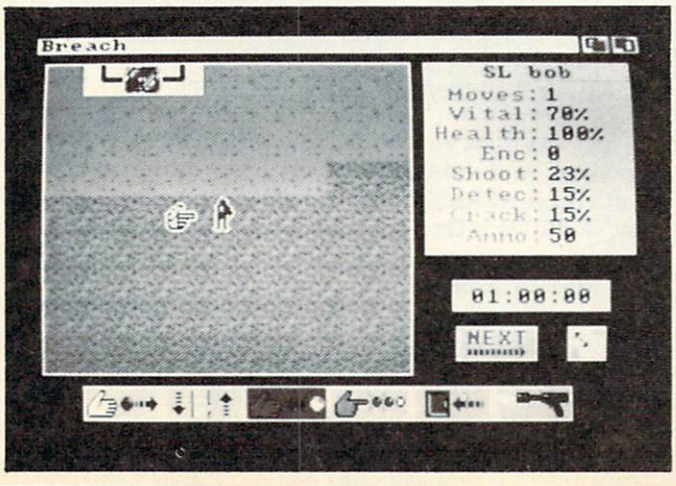
Graphics: 87%
Sound: 53%
Playability: 62%
Overall: 60%
Price: £9.99 (c)
£14.99 (d)

BREACH

Omnitrend

"We Want You ... For the Federated World's Special Forces". So says the title heading on the box of Breach, Omnitrend's SF, tactical combat game. At first sight Breach is remarkably similar to Paladin. In fact, what Omnitrend have done is develop one basic game system and then apply two different, stand alone, game worlds to that system. Paladin being the fantasy adaptation while Breach fulfils the SF quarter. All the basic qualities are there. So if you are a Paladin veteran you could easily load up Breach, with no previous knowledge of it, and start playing straight away. Only cosmetic changes occur. For example, in Paladin, you would select an icon to swing your sword. Within Breach you would select the same icon to fire your laser rifle.

In Breach you become a Squad Leader (SL) commanding a group of men through a variety of scenarios. As in Paladin each scenario is a means unto itself but the main target is for your SL to reach "Star" level. Active participation being the only way to improve your character. For example, with each opponent that your SL kills your Accuracy rating increases by one percent. Using cracking and detector units will increase those ratings, and so on. The improved ratings only come into effect at the end of each scenario, however. A well-developed SL qualifies for extra training and equipment which then enables you to undertake "Star" level scenarios. Your men are divided into Marauders (basic marines), Scouts (with similar weapons but with lighter armour for greater manoeuvrability), Infiltrators (similar to scouts with a lighter gun) and Psionic Talents (who have poor quality weaponry, light armour but have the ability to "mind-stun" the enemy). Your opponents range from Overlords (a sort of Darth Vader character) to Beasts (who are basically a set of teeth on two legs). Weapons differ from Paladin in that the swords are replaced by lasers, healing potions by Medikits and crossbows by rocket launchers.



The combat area of the game is resolved as follows: The power of the Laser Rifle, the common Marine weapon, and the protection from suit armour are given as percentages and are listed within the manual. Thus if your man fires his Laser Rifle, with a Gun Strength of 55%, at an enemy with a Suit Protection of 30%, the victim's health will drop by a total of 25%. Obviously this will vary with different weapons and differing opposition. Similarly, if you weigh down one marine with a variety of equipment his encumbrance value, that is how much he is carrying, will increase, but his movement points will decrease. In addition to these factors are each marine's personal skill abilities. They are measured in percentages and cover the marine's accuracy with a rifle, his ability to operate a cracking unit and his ability to operate a detector unit.

Breach encourages you to delegate tasks among your men. This is because each class of Marine displays a variety of skills and weaknesses. It is up to you, therefore, to decide where and when to apply a particular section. Marauders, for example, form the basis of your squad. Generally, they show a good rate of accuracy with a rifle but cannot move too far. In addition to which they are rather poor operators with cracking and detecting units. Scouts are far more mobile. They can be useful in transporting equipment and in reconnaissance. They are also proficient with a detector. Psionic talents are poorly equipped with poor shooting accuracy but they have the ability to stun opponents, thus rendering them paralysed for the next turn. Infiltrators are not really fighting men. They are most useful when operating cracking units. Used adjacent to a computer, these units show the interior floor plan of any building along with any enemy who is in hiding.

A useful additional feature is the briefing which is available before each scenario, detailing the background of the task in hand and the essential criteria needed to complete the scenario. An example may be to inflict 50% casualties while rescuing all of the hostages. This useful feature can be accessed throughout the game to check if all of the necessary tasks have been completed.

As with Paladin graphics are simple but effective. When throwing a grenade, for example, a bright red explosion is followed by all of the surrounding structures being reduced to rubble. Sound is kept to spot effects of powered doors opening, Beasts roaring and so on.

In conclusion, therefore, Breach is ideal for all those players who liked the look of Paladin but who could not stomach yet another fantasy game. Criticisms, good and bad, can be referred to the Paladin review as Breach is basically the same game.

Price: £35.00

P.R.

BALANCE OF POWER

THE 1990 EDITION

Chris Crawford is something of a leisure software Guru in his home country of the USA. His reputation for the degree of imagination and flair which he introduces to his game has elevated him to the position of one of the top designers in the United States. In addition, he has strong views on software design in general. He even wrote a book on the subject, "The Art of Computer Game Design".

After leaving Atari, where he wrote "Eastern Front 1941", among others, Chris Crawford set himself up as a Freelance Designer. It was during this period of his career that he wrote the original Balance of Power. It immediately caught the gaming public's attention. The design and sheer depth of this masterpiece earned Crawford critical acclaim the world over. He has had no peace of mind since because of the demand for a sequel; demand which has been satisfied with the publication of an updated and modified version, "The 1990 Edition".

For those of you who may have missed it the first time around, I will give a recap of what the game is all about. Balance of Power is a Geopolitical simulator for the nuclear age. You, the player, are offered to control either the USA or USSR. The object of the game being a contest between the two Superpowers to see who can gain the most power and prestige. One way of achieving this is to "donate" military or economic aid to a chosen country, which will help to improve relationship with the incumbent Government or, as an alternative, aid rebel forces or send American troops to subvert a particularly intractable Government.

The game offers a well presented interface which is well suited to the Amiga. Mercator projection images contain all of the relevant information which is requested by the player. For example, clicking on the "countries" portion of the menu bar, which runs along the top of the screen, brings down a menu containing a variety of choices. Not all of which will be selectable. Those that are not will be "grayed". Selection "spheres of influence", for example, changes the world map displaying a variety of colours with an associated Key. The clear, concise graphics will enable you to assess who falls within your "sphere" within an instant. Clicking on a country will highlight it and bring up a window which contains a variety of information such as that country's relationship twoards you, your prestige value in that country, how much aid you are giving to the Government or Rebels, the country's political philosophy, the Government stability and so on. It is on this screen that the player can judge who holds sway within the country. So a decision about whether to support the Government or the Rebels can be made.

There is Government opposition in every country but it is the strength of this opposition which will influence your decision about whom to support. However, the decision about Aid is not as simple as that. Some strong Governments, with an ineffectual amount of internal insurgency who are hostile to you may never accept Aid of any sort. While some may accept Economic Aid but not the insertion of troops. However, it is when you become heavily involved in a country which is under the sphere of influence of the other the other Suerpower that confrontations occur.

Let us say that, as the USA, you have noticed that the USSR has stopped all military aid to Vietnam. In a fit of historical deja-vu you decide to send in the Marines. At the end of the turn the USSR responds to your imperialistic attitude by having a private word in your ear. Being of a staunch nature you ingnore the protest. However, the USSR will not take this action lying down so they announce the world that they deplore the aggressive actions of the USA. While it may have cost you nothing to back-down after the first protest, now the USSR has gone public the eyes of the world are upon you so prestie is at stake. The country who backs down now loses prestige points. Threats are cast between the parties and if no-one backs-down the issue increases in tension so that DefCon procedures are taken. If the tension escalates to DefCon1 then nuclear war begins and the game ends. A final message lets you know, in no uncertain terms, that you have lost. This situation will not occur all of the time but alot will depend on your judgement of each particular case.

The latest version, "The 1990 Edition", has a database updated, for every country, to the beginning of 1988. One of the minor crticisms of the first version was the exclusion of certain, smaller countries. To rectify this the latest version now includes 80 countries instead of 62 with additional information for the "Background" section. Each Superpower now has the option of interfering in other country's policies, home and foreign. The most visual change is the addition of the "Crisis Advisory" board who lend their experience to a particular situation in an effort to guide you. This feature is particularly helpful for beginners. Finally, there is the addition of the "Multipolar" level of play where all of the world's countries play a bigger part in the game.

The original version of Balance of Power was innovative and imaginative with an unprecedented depth (and width!) of gameplay. The latest "1990 Edition" exhibits a thoughtful fine-tuning of the original. Each improvement contributes to the game resulting in a mature product which nobody can afford to be without. One thing is for sure. We have not heard the last of Chris Crawford.

P.R.

Graphics: 88%
Sound: N/A
Playability: 100%
Value: 100%
Price: £24.99

Charts

Chart Chattering Events

Crime must still be stalking the land – and being battered and squashed by the half man half cop ... Yes, old Robobobby is still your very hottest choice of all the 64 games in the U.K. That's the second loony, sorry, lunar period that you have made that decision, voting with your wallet through the hundreds of computer stores (though it said that Boots, Smiths and Woolies sell nearly half the games in the country). We gave it a Mega rating and obviously so do you. Ocean's other newest biggie, Dragon Ninja chops up another place to Number Two. U.S. Gold has a new entry that has zoomed in Denaris (or should it be Daniellis?) which looks like it could move into the Top Spot next time. Two other first timers in the Chart are Tiger Road from Capcom (read that U.S. Gold) and Ocean's compilation In Crowd, which CCI will cover in the next issue.

One surprise new entry among all these blood and bloody thunder arcade bang 'em aways is War in Middle Earth, the Hobbit-style saga from Melbourne House (read Virgin, read Mastertronic). It it a sign that all you out and out joystick blasters are getting old and turning to adventures and RPG's (Eat your adventrous heart out, Andy Moss!) If so, watch for Zork to start hitting the Charts!

In the Amiga Chart, a new Number One takes a bow: Cinemaware/Mirrorsoft's marvellous TV Sports Football takes over from last month's FTL/Mirrorsoft's marvellous Falcon. Will Maxwellsoft soon own the whole 16 bit world? Entering sharply at Number Two is the fabled Kristal. Yes it is in the shops and you are buying the Story of Dancis Frake like £1 coins for 50p. Discovery's Sword of Sodan hangs in there at Two but System 3's brilliant International Karate Plus makes a strong showing at Five.

Budgetowise ... You are still sliming them with the best and keeping Ghostiebusterers from Mystertronic up at the great Number One. U.S. Gold Kixx in with World games at Two and there is a newie from recent cheapostar Alternative, Gun Boat entering at Four. See you next month among the Chartbusters again! (If the Hobbits don't get me!) ***Z.M.S.***

GAME TITLE	COMPANY	LAST MONTH	PRICE	RATING
1. Robocop	Ocean	(1)	£9.95	Mega
2. Dragon Ninja	Ocean	(3)	£9.95	Mega
3. Denaris	U.S. Gold	(-)	£49.95	Mega
4. Afterburner	Mediagenic	(4)	£9.95	Crisp
5. Operation Wolf	Ocean	(2)	£8.95	Crisp
6. War in the Middle Earth	Melbourne House	(-)	£14.95	Mega
7. Microprose Soccer	Microprose	(7)	£14.95	Mega
8. Tiger Road	Capcom	(-)	£19.95	Crisp
9. In Crowd	Ocean	(-)	£9.95	T.B.A.
10. Double Dragon	Melbourne House	(8)	£9.95	Iffy
Amiga				
1. TV Sports Football	Mirrorsoft	(3)	£29.99	
2. The Kristal	Prism	(-)	£29.99	
3. Sword of Sodan	Discovery	(2)	£24.95	
4. Falcon	FTL/Mirrorsoft	(1)	£29.99	
5. Intl. Karate Plus	System 3	(-)	£29.95	
Budgets				
1. Ghostbusters	Mastertronic	(1)		
2. World Games	Kixx	(-)		
3. Werewolf/London	Mastertronic	(2)		
4. Gun Boat	Alternative	(-)		
5. Knightmare	Mastertronic	(3)		

UMS

Rainbird

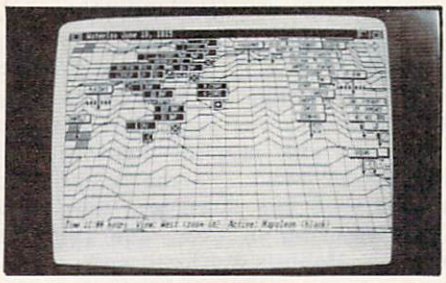
The Universal Military Simulator (UMS) is billed as "The Ultimate Wargame Simulator" which is quite a claim to live up to.

There are two major parts, The Simulator and The Editor, supplied on separate bootable disks.

You are presented with a screen that prompts you to select from one of the five simulations included on the master disk. The battlefield map is drawn with a grid on which is placed all the landsacape features, including forests, hills, ridges and depressions. Then all the individual units, each with its own flag, are placed on the relevant grid points. The name of your chosen scenario appears at the top of the screen and the (military) time, direction of view and active army appears at the bottom. The scenario now divides: the issue Command Phase in which orders are given to each of the units, in both armies; and the Movement/Battle Phase where the previously issued commands are executed and any conflicts are resolved. Each complete phase is split into eight segments. All participating units may be given specific orders that control the unit's actions and condition throughout each segment.

When all commands have been issued to both sides and End Command Phase is selected a requester box asks you to decide whether either, or both, armies will be under human or computer control. If either side is placed under computer control you are then asked if you wish the computer to attack or defend, or assume full control and decide it's own strategy.

Each time combat occurs, the computer signals by flashing the flags of the units concerned. When the fighting is finished, it is possible to examine the outcome and decide whether each unit should continue fighting or retreat. In all cases, the computer will decide the outcome of each fight.



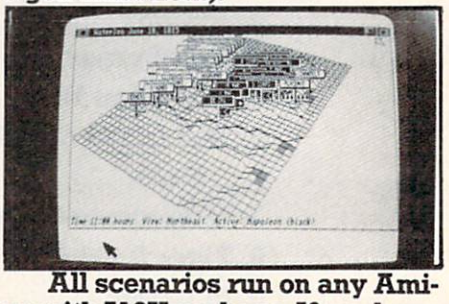
When the simulation reaches a previously determined time, or when all the units from one army have been destroyed, a "Final Battle Analysis" screen is displayed.

Part Two of UMS is, in my view, where the real power of this program lies. The Editor allows you to create your own armies, battlefields and scenarios or take existing ones and adapt them to create totally new outcomes. It is even possible to take two armies from different time-periods and put them into battle against each other on a battlefield from a third. I actually placed Darius III (a Persian Emperor from 331 B.C.) opposite Napoleon, on the battlefield at Gettysburg!

Designing a map for the battlefield has been kept as simple as possible. If you wish, the computer will do it for you, by selecting a random map option. Should you choose to do it for yourself, then you are able to add forests, hills, ridges, and depresions to the grid that is displayed on screen. Landmarks, Villages and Cities may also be added, each with it's individual name. As with the battlefield screen, you can look at the map in all of the zoom modes and from all directions. When your armies are complete and the map is finished they are brought together in the Scenario Creation section.

The Universal Military Simulator includes the two program disks, an A3 size map of Gettysburg, a sixty page instruction book and a sixty-eight page Scenario Handbook. This last item serves as the "protection" for the program and explains in detail, the five scenarios.

Also supplied were Scenario Disks One and Two. These are add-on disks containing other battle scenarios and can only be used in conjunction with UMS. Each disk contains three separate scenarios, Disk One from the American Civil War, (Antietam, Chattanooga and Shiloh), Disk Two from Vietnam (Hill 823, Hill 875 and Ngoh Kam Leat).



All scenarios run on any Amiga with 512K or above. If you have 1 Meg or more, you will also benefit from enhanced sound and graphics. The scope and flexibility of this programme is only limited by the user's imagination and ability. There is only one thing that I would like to see added, the option to enable to players to compete via modem.

I used an unexpanded A500 for this review, so I am unable to comment on the "enhanced sound and graphics". Apart from the instruction book, everything else about UMS is, in my opinion, superb and I have no hesitation in giving it an "Overall" score of 90%.

Price: £24.99 **N.S.**

KICK OFF

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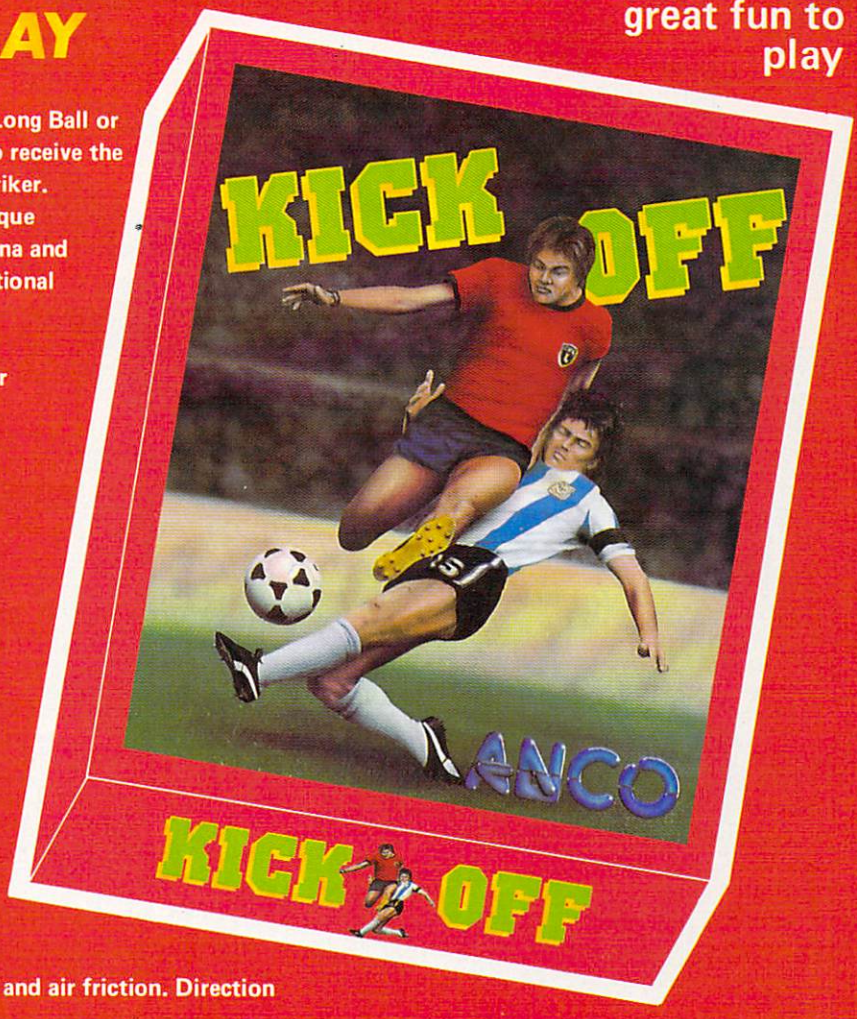

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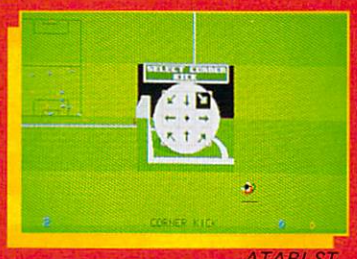
PLAYING IT IS EASY
MASTERING IT WILL TAKE TIME - A LOT OF TIME

AMIGA

AMIGA



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US Gold

Danger Freak

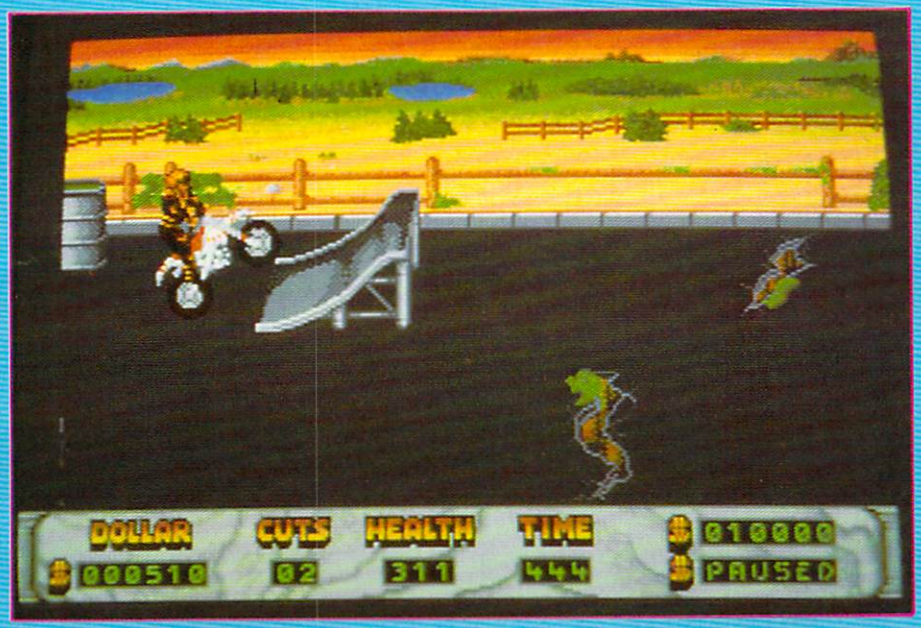
Danger Freak marks the end of US Gold's distribution deal with Rainbow Arts. Moving away from the controversial themes of The Great Giana Sisters and Denaris, Danger Freak goes for a more original approach.

Life as a stunt man is full of risks, but at least you have a good agent. He has fixed you up with work in the shooting of three films. Presumably all the films are running behind schedule, as every take is confined to a tight time limit. If you overrun, the director won't hesitate in firing you.

Your first job is a three-part motorbike chase scene. You begin at one end of Anarchy Road, a highway littered with ramps and barriers. The more spectacular your performance, the more cash you earn, so ducking under the barriers and jumping the ramps is essential for a sizable bank account. Jay-walkers armed with baseball bats refuse to be run over, swiping as you pass. Strangely, your health rapidly deteriorates if you sustain a wheelie for more than a faction of a second. Manage to avoid death from prolonged wheelies and you will find yourself flying through the air after impact with a roadblock. Brushing yourself down you hobble up to a waiting car and with careful speed adjustments, leap onto a rope ladder hanging from a helicopter.

Between each level you get to play an irrelevant but enjoyable Supersprint clone.

It's onto a jetski for movie number two. The ramps, ditches and barriers of the first level are



replaced by logs, mines and sharks. Instead of a car at the end, you now rendezvous with a submarine before escaping once again up that dangling ladder.

Flight of Icarus is the title of the finla sequence. In this you pilot a tiny aircraft through a hazardous horizontally scrolling sky. Vicious birds sink their talons into your flesh and must be sjaken off with a bit of stick waggling, while the missiles and rocks from active volcanos constantly batter your Bond-mobile. The climax of the scene comes as you bail out just before a missile rams you from the rear. Parachuting down to a landing platform, the game demands you straighten your legs for a safe touchdown. Not an ideal technique in reality, but then the rest of the game is hardly realistic either.

The spectacular exploits of a stuntman lend themselves well to a computer game. Rainbow Arts' interpretation is not all it could have been due to lax standards in places. More thought could have gone into the score and status system. The idea of losing health through holding the fire button in mid-air is strange, and seems like an afterthought to balance up the difficulty level. Though the multiplane scrolling is smooth, the raphics have a generally scruffy look about them. The soundtracks do little for the game and are merely less tuneful versions of those heard in Denaris.

Despite a few low points, Danger Freak manages to pull through on its diverse gameplay. It's by no means the ultimate stuntman simulator, but comes closer than any previous attempts and is certainly a game that offers a very acceptable level of entertaintment. Check it out.

T.H.

Graphics: 58%
Sound: 60%
Playability: 66%
Overall: 62%
Rating: CRISP
Price: £9.99 (c)
£14.99 (d)

Amiga

A more detailed stuntman sprite for the motorbike scene gives a promising first impression. The gameplay remains surprisingly close to the 64 version, the only difference being the slightly less responsive controls. Unfortunately the interlude is spoilt by the bikes' poor handling. A few pleasant Euro-pop synth tracks back the game along with a sprinkling of effects. In all it comes out on par with the 64 game. As usual, the game is no different but you get some spruced up graphics and sampled sounds for the extra wedge.

Graphics: 72%
Sound: 70%
Playability: 65%
Overall: 60%
Rating: CRISP
Price: £19.99

Danger Freak

THE RUNNING MAN

Grandslam

"Showtime!" announces Damon Killain in a fit of enthusiasm. In the year 2019, the light-hearted likes of Tarby and Bruce are on the scrap heap. If you want to make it big in TV in the 21st century, you have to be mean! Mr Killain is the host of his own brainchild gameshow, The Running Man. Bored with watching newly-weds win tumble driers and holidays, the viewers of the future want live pictures of real life and death confrontations. The Running Man gives it to them; contestants are convicted criminals, their single goal is to survive. Ben Richards, an innocent victim of a harsh and legal system, is this week's contestant. No-one has ever returned alive, but then they were not played by Arnold Schwarzenegger.

A long intro, lengthened by a good deal of disk access has been put together from clips of the film. From the centre stage, Ben is shot at lightning speed through a tube into the game zone. The ice rink is the first of four zones, where the local ice hockey teams' canine mascot breaks you into the game. Kick him back as he lunges for your neck to preserve that essential life-force, but like you he's up for more after a dazed couple of seconds. For such a muscular athlete, you find it strangely difficult to jump short distances precisely. The initially frustrating platform leaping is without a rightful place in the game, though fortunately the emphasis on it is laid off as you progress. Subzero is the first zone's "stalker". An ex-ice hockey hero, Subzero gets the first crack at the running men with his explosive pucks and head-splitting hockey stick. Beat him and you are given access to the next zone.

Out of the studio into the rough suburbs now, a warped lumberjack called Buzzsaw teams up with the persistent German shepherd still snapping at your ankles. One man against a chainsaw is no match, even for Ben, so the discarded bricks and lead piping come in very handy. Another plus here is the media-pack which revitalises a battered contestant.

So it continues; zone three is set in what was once Los Angeles, the fourth pits you against a flame-throwing jet-packer, and the finale comes as you make it back to the studio to defeat Killain's guards.

The Running Man was programmed by Emerald Software and has quite a few similarities to another of their current projects, Vigilante for US Gold. The music is almost identical to Vigilante, as is one of the biff sound effects in particular. The game however is far more impressive in its graphics. Ben is large and smoothly animated, and the three levels of overlaid scroll-planes work just as well. While the intro does a good job of setting the pace, the game sometimes struggles to keep it up. As a conversion of the film, it is not quite as frantically savage as it could be, but goes a long way towards it. Recommended.

T.H.

Graphics: 81%
Sound: 62%
Playability: 70%
Overall: 71%
Rating: CRISP
Price: £19.95

Adventure

THIS MONTH ANDY GETS A BLIND DATE WITH LEISURE SUIT LARRY, INTERVIEWS AL LOWE FROM SIERRA AND STILL HAS TIME TO REVIEW SOME HOT NEW ADVENTURES.

BY ANDY MOSS

ADVENTURE COMMENT

Another hectic adventurous month has seen me almost married off on a ship in the middle of the Thames, have a fascinating conversation with Al Lowe the writing wiz at Sierra, move heaven and earth to get a workable copy of GALDREGONS DOMAIN (since the one I was sent refused to behave itself) and get rescued from a burnt out power pack by Commodore themselves who kindly supplied me with a new one by special messenger. All this and still time to review some hot new material, especially a Home Grown adventure called TIME THIEF from a company called Big Sky Software.

First though, an apology for a few omitted pictures, articles and letters in last months column. This was due to a typesetting emergency just before going to press, which drastically reduced space permitted, so this month I will put in a double dose of the BARDS TALE II solution along with two maps. Hows that!

My blind date adventure began during a press reception hosted by Activision on behalf of Sierra Software, aboard HMS Belfast, a veteran warship permanently anchored on the River Thames near The Tower Of London. We were given raffle tickets upon entry, and told that at some time during the proceedings, a draw would be made to find three willing men for an exciting challenge. This turned out to be a reenactment of Leisure Suit Larry's Blind Date sequence, where ol' Larry gets to meet the girl of his dreams. Well your hero duly got chosen as a contestant, and not being one to run from the face of adversity, I accepted the challenge.

As it turned out, the girl in question was none other than Polyester Patty, the new female Larry that Sierra is working on, but that is another story. We each had to answer three questions about how we would handle a certain compromising situation with Patty, and whoever impressed her the most won a free trip to meet Sierra in California. I cannot lie. She didn't pick me, she picked one of Activision's distributors, a nice chap , nothing that two bottles of deodorant wouldn't fix, but that's her problem!

As they say, so close yet so far, but thats showbiz.

Onto this month, and look out for the review of TIME THIEF, a mail order adventure, POLICE QUEST from Sierra and BEYOND ZORK from Infocom, but first an interview with Al Lowe.

SIERRA'S CHIEF WRITER AND DESIGNER AL LOWE SPILLS THE BEANS ON WHY SIERRA ARE THE ADVENTURE HOUSE OF 1989

He looks a bag of fun does Al Lowe, short, tubby, balding and bearded, he is the brains behind the cult Leisure Suit Larry series and a host of others that have brought a unique style of adventure playing to our screens. Full 3D graphics with characters that can move around, behind or in front of objects on the screen, and incorporating a heavy duty text parser so the user gets the best of both worlds. 'There is a lot of me in Larry' he says, 'I have tried to create a guy who loves life, loves picking up women, and generally having a good time. Unfortunately, in Larry II he has to deal with a hell of a lot more nastier people, but still have time for getting kicks'. Larry rose to fame here in the UK when the City Yuppies pirated the game onto their office PC's and managed to virus the whole City network along with it.

Al is justifiably proud of what has been achieved at Sierra, 'When we started, adventure games were just moving into graphic status, using single picture screens to portray the scene. We wanted movement in our stories, and also to support as many machines as possible, so we designed a system that would auto-

cont. on next page

More Adventure!

continued from page 69

matically convert the game to any machine we wanted. We develop on an IBM and just run the program through a black box of tricks and the whole thing, graphics and all, converts across.' The success of the system has enabled the company to broaden its range from the initial KINGS QUEST series, to cover space, police,fantasy and science fiction. 'We are constantly tweaking the black box to get better and better graphics from it, and now we even have some fabulous atmospheric music in the new stuff'. With Space Quest III completed, and Larry III designed, Sierra are looking to really clean up this year, 'We already have 20% of the entire adventure market in the US, and some of the most talented designers and musicians in the business. Watch out Infocom you aint seen nothing yet!' Al has the Americans' natural gift of total PR overkill, but for all that, I have a lot of time for Sierra's work. Lets hope they go from strength to strength.

ADVENTURE NEWS

ACTIVISION START HELP LINE

Activision have appointed Julie Barwick as Consumer Relations Coordinator,to provide customers with an efficient and helpful support service. Julie is there to provide hints and tips on gameplay as well as dealing with general software enquiries. You can get in touch with her between 2.00pm and 6.00 pm Monday to Friday on 0734 310003. Just think, now you can phone up when you get stuck on a Sierra or Infocom adventure and find the clue!

BATTLETECH ON 64

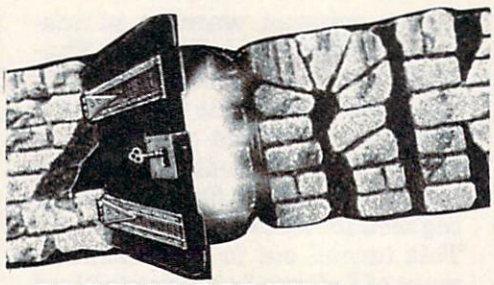
Infocom have announced that their RPG BATTLETECH has now been converted to the 64 on disc only. You play Jason Youngblood, a warrior cadet who must preserve his planet, honour and life.

The game includes THE ARENA, a gladitorial module that enables you to increase your skills and obtain needy supplies. It features the largest rpg universe ever created with over four million locations as well as animated sequences.

Out this month £14.99

ZORK ZERO HAS ARRIVED

After a few mentions in this column and a lot of 'next month for sure' ZORK ZERO has finally been finished for the Amiga. Due out this month, the game features a wacky jester who keeps you busy solving puzzles, paradoxes with objects ranging from curious to sublime. Mixed up with visual puzzles (and I can vouch that some of them are really wicked) there are also maps and a Zorkian encyclopedia. One to watch out for.



GAC PLUS, FOR THE 64

After bowing to considerable public pressure, Incentive have released a rewritten version of their classic Graphic Adventure Creator. Now you can write adventures to an incredible size limited only by the number of discs, as they have altered the program to allow 'stand alone' games.

The adventures can also now be published without permission or payment to Incentive, or a mention of any kind. This extremely useful tool is available for £29.95 exclusively from Mandy Rodrigues 24 Maes Y Cwm Llandudno Gwynedd LL30 IJE. You can also upgrade your old disc for just £10. Mandy is also Editor of Adventure Probe, that fine fanzine that is just packed with items on adventure.

MIGHT AND MAGIC II SOON

Subtitled 'Gates to another world' Might and Magic II is the sequel to New World Computing's well recieved RPG that found fame and fortune in these hallowed pages. The new game has some new features, including an 'automap' mode which records your every movement inside and outside and across all centuries, as you can see there is a lot of travelling to do.

Poor old Cron is in trouble again. Once it was a land of peace and prosperity, now the leaders are vanishing one by one and sword and sorcery is all around. There are hundreds of quests, with over 250 monsters, 96 spells, 250 weapons and a host of character classes to pick from. Personally, if the princess looks anything like this picture then you can keep her, I would prefer to fight a Balrog anyday.

ADVENTURE MAILBAG

Dear Andy

As you know, us in Australia get your magazine about 6 weeks late. So I've decided to get in early. In the January issue I read you were going to review ULTIMA V. So I've sent you the ending screen hoping you are giving a prize to the first finished. Here too are my top 10 adventures, 1 Ultima V 2) Ultima IV 3) Ultima III 4) Uninvited 5) Phantasie III 6) Legend of the Sword 7) Faery Tale 8) Corruption 9) Mortville Manor 10)The Pawn.

Brett Skewes, Victoria, Australia

Well done Brett, that really is an acheivement, as I know that Lord British feels that Ultima V is the hardest one yet. Really I cannot give you a prize as it wouldn't be fair to anyone else, as officially there was no competition. I see from your list that there are no Infocom games mentioned, is that because you hate them, or is it that you cannot get them in Aussie? Talking of Aussie, the next letter is from that old pickled cue, the Gerkin who sent me a drawing of a

final screen in a pathetic attempt to get a prize for finishing Bards III.

Dear Andy

I refer to your article concerning Bards III and my reward. Please find enclosed photo of final screen (sorry about the poor picture – cheap camera). I would be obliged if you would send any reward to Mr Gerkin at the enclosed address. Also the Gerkin is in a spot of bother in Deja Vu. How do you open the medicine cabinet and how do I know if the syringe has been used by any one else. Thanks for your great article about the States, and my sister sends her love.

See ya, Sir g

Dear Gerkin, thanks for your feeble effort, I have given it to my dog who is partial to a bit of corn. The medicine cabinet puzzle is one of the easier problems in Deja Vu, all you need to get is the key. The trail for this starts with searching the lady in the trunk of the car, and visiting a certain penthouse flat.

Dear Andy

I wonder if you can help me in President Is Missing. At the beginning you are told to call up the official report on the abduction of the President. This is necessary to begin the game, the manual says that this is filed under DOCUMENTS. Three of us have tried to find this report and all we can find is a set of memos to staff. No report. What to we need to do to find it.

Robin Bootle, Cookham

Well Robin, all the clues you need to start off the game are contained on the tape cassette supplied with the game. The report you speak of is only a transcript of the material on the tape.

Dear Andy

A plea from a lost soul wandering about in Bards Tale II. I have been playing it for around 6 months now and I am getting pretty desperate. I heard it whispered that you have printed the solution last year so I am hoping that you can tell me what to do. Here they come again 8 berserkers,4 goblins and the jolly green giant. You are my last hope pleeeeeeeeese!

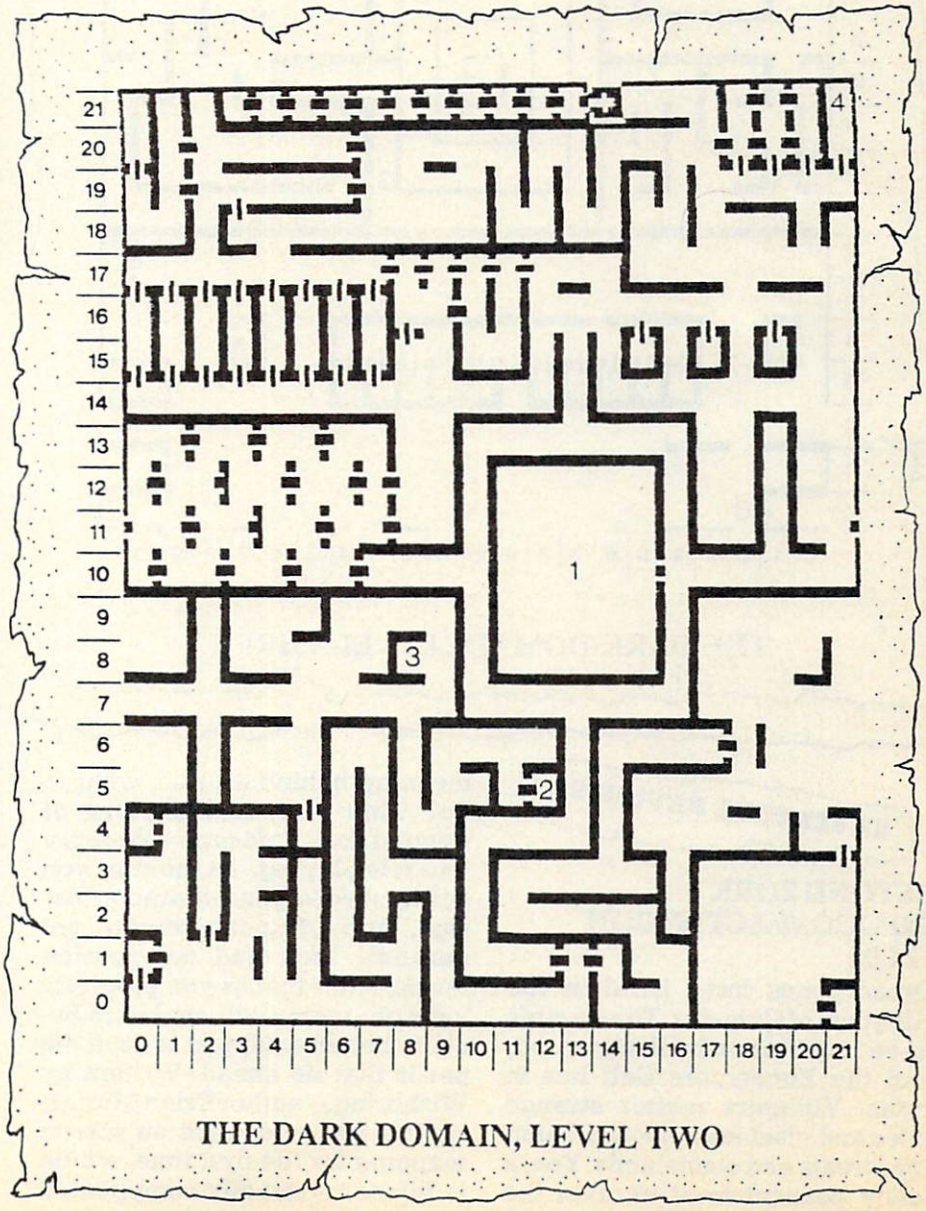
Brian

Fret not Brian, for last year was the solution to Bards tale I! This year I have just started Bards II so keep reading and all will be revealed in the fullness of time.

BARDS TALE II SERIALISED SOLUTION CONTINUED

THIS MONTH THE DARK DOMAIN LEVEL THREE

1) At first it appeared that the party was in a rectangular room with no way out but the way in which we entered. There is a teleport trap here which Andreas discovered. 2) We were teleported to another location in the dungeon into the middle of a large room, three squares wide and long. We sensed the presence of traps so we proceeded cautiously moving straight forward until we encountered a wall. The middle square of the room suddenly became walled off. Facing south, we continued until we reached a wall, then turned east. Soon we came across another wall and when we cast a light spell we saw a door. We went through and found at the end of the corridor a message 'SEEK THE FOUR CORNERED LETTERS'. Lots of darkness here, as we moved north and into room 5) we should have reached the end of



THE DARK DOMAIN, LEVEL TWO

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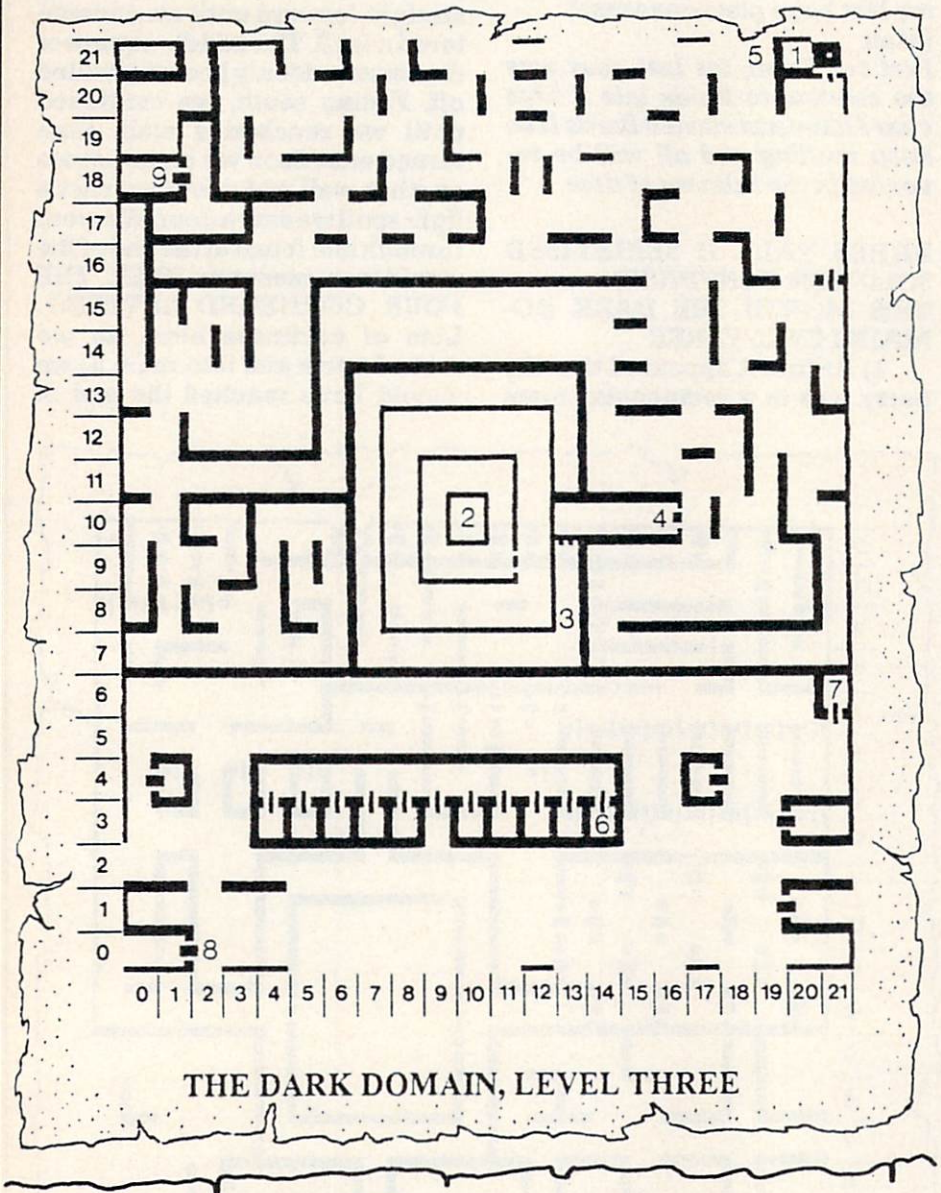
continued from page 71

the dungeon but no! we continued north! We found out that this place wraps itself around and so reaching the northernmost part finds you at the south end.

We came across a riddle 'look at the spells of sorcerous kind, whos the master of mind?' Andreas answered 'Mangar' and a doorway opened. Another question appeared, 'SPEAK THE WORD TO PASS BY'. The answer was obvious, Andreas said 'PASS' and a stairway appeared descending. We marched down the stairs.....TO BE CONTINUED.



THE DARK DOMAIN, LEVEL THREE

ADVENTURE REVIEWS

BEYOND ZORK
INFOCOM/ACTIVISION
£24.95

Dread times have befallen the Kingdom of Quendor. The wizards have mysteriously disappeared, and the Enchanters Hall lies in ruins. Villagers mutter strange tales and viscious monsters haunt the streets and wastelands. You, a lowly peasant must unravel the meaning behind all this, what to do? This then is the story of Beyond Zork, Infocoms first foray into role playing. At the start you get to choose your character design, by picking out strength, endurance, luck and compassion levels. After that as you progress, your character will evolve to become better equipped to face the perils that lie ahead. Written by Wishbringer author Brian Moriarty, this game features on screen mapping for the first time, which in Infocoms steadily complicated design, proves to be a good friend indeed. This apart, the game plays like any other Infocom game, with plentiful text descriptions and generous character interaction. Indeed there are more than a few references to old Zorkian friends and locations. When you discover eventually that your goal is to recover the famed Coconut of Quendor, which just happens to lie deep underground you know where, all the old places from Zork come back in glorious blue and white.

An absolute must for your Infocom collection

PERSONAL RATING:9

POLICE QUEST
SIERRA/ACTIVISION £24.95

You are Sonny Bonds, street cop extraordinaire protecting the town of Lytton. This is a 3D animated adventure that has you chasing a big time drug dealer, with a street name of 'Death Angel'. All you know at the start is that there have been a number of homocides recently, all drug related, and that someone is not kosher. Patrolling the town (after certain police procedures have been adhered to) you soon begin to unravel the mystery. The game plays in a fairly linear fashion, and most of the puzzles revolve around how to get vital information out of the characters at set scenes. You need to learn how to drive properly, (crashing gets very tedious as you die each time) and remember to always close your car door when you leave it, or you just might find it stolen when you return! Police Quest II promises better graphics, which when you realise that these are ported direct from MS-DOS are not too bad at all. I would recommend this one for beginners mainly due to the linear lead through you get with it, but it is still worth playing at any level, just because its different to anything else you see around these days

PERSONAL RATING.....7

THAT'S IT FOR ANOTHER MONTH, NEXT ISSUE WATCH OUT FOR A REVIEW OF A SUPER HOME GROWN ADVENTURE CALLED TIME THIEF, AND LEISURE SUIT LARRY II, TILL THEN HAPPY HUNTING.

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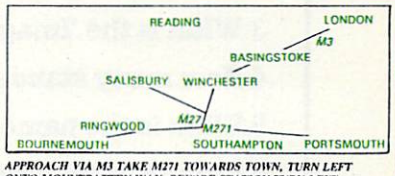
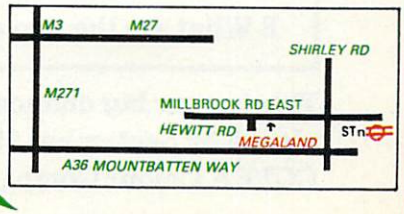


APPROACH VIA M3 TAKE M271 TOWARDS TOWN, TURN LEFT ONTO MOUNTBATTEN WAY, BEFORE STATION TURN LEFT TOWARDS SHIRLEY AFTER 50 yds LEFT INTO MILLBROOK RD MEGALAND IS 250yds ON THE LEFT, 3 MINS WALK FROM STATION.



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No way.

Answer the questions correctly this month, and eleven lucky Amiga owners will receive:

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★ A Philips colour monitor (1 winner)
OR
★ 2 vouchers worth £10 each off of Electronic Arts games (20 winners)

So, let's make peace, and have fun too.

Electronic Arts, creators of the amazing DeluxePaint series, is the proud sponsor for this month's competition. For your chance to win, answer the following questions:

1 What does 'UDG' mean?
2 Who wrote the DeluxePaint series?
3 What is the 'Image Maker'?
4 How many standard colours does an Amiga have?
5 What is the name of the first disk drive available for the C64?
6 What was the original name of DeluxePaint?
7 What does dpi mean?
8 What are the two animation modes in DeluxePaint III?

This is your big chance to add colour to your computing world!!! Answers on a postcard please by September 25th to:
CCI/EA Colour Comp., 40 Bowling Green Lane, London EC1R 0NE.

S-ENTRY Preview

Tired of typing in programs and finding you have made a typographical error? Get ready for a fantastic exclusive for C64/128 owners — S-ENTRY is coming!

CCI has commissioned The S-ENTRY program entry system to enable error free input of printed listings for C64 and C128 owners. The program will work in this way: first you will enter the S-ENTRY program itself in the form of a Basic loader. (The SAME program is used for the C64 and the C128, S-ENTRY is able to sort out for itself what machine it is running on.)

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S-ENTRY is not just an error checker, as it does allow you to choose how you want to use it, and it also has a few functions that will help you debug a program even if you did not type it in using S-ENTRY.

If you choose not to use S-ENTRY, you can simply enter the normal basic lines after the S-ENTRY code. The ONLY difference that S-ENTRY makes to the published listing is the addition of the four character code before the line number, and the addition of the Final S-ENTRY code at the end of the listing.

S-ENTRY will be published in CCI in the August issue. Look for it!

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Variety Is The Spice Of Life

Peter Gerrard 'ventures' into the fabulous variety of RPGs ...

I have finally decided that there would be little or no point in listing the Venture program out for you in its entirety, as only a few brave souls would ever make the effort of typing it in. Even they would probably make a couple of mistakes in doing so (lengthy listings are notorious for this) and would send me a copy on tape or disk to have a look at and hopefully correct. This is, in itself, fair enough. The author of a program should know far more about it than the person gamely trying to type it all in, and thus in theory should be able to look at the non-functioning version and fairly soon go ahah!: problem solved. However, apart from making more work for me there is also the point that the person at the other end of the line, patiently (or impatiently!) waiting for their program to re-appear, could wait for a couple of months before getting a reply. This might seem a long time, but take into account that someone has to send the listing in to CCI, they have to pass it on to me, I have to find the mistake, and only then can I write back.

G.M.

So, in order to save us all a lot of time and trouble, I will work out the details for next month and make the programs available on tape or disk at some price or other from some address or other. We will get it sorted out for next month, don't worry ... be happy, as the song tells us.

Having made that decision, we are now free to concentrate on another aspect of role playing games, and that is how to go about making them different from one another. Variety is the spice of life, as the heading for this article tells us, and just as early adventure games had a habit of being remarkably similar, so too do early role playing games seem in danger of following the same path. This is, needless to say, not the only thing wrong with some of them, so we'll take a look at the various ways in which role playing games appear to be developing, as well as ways in which faults (if any) could be rectified.

First of all, we must remember that the definition of a role playing game is a very broad one indeed. Virtually anything is being classed as a role playing game at the moment, just because RPG is the buzz-phrase of the year (to use an awful term). Rather like when all distributors refused to accept adventure games that did not have graphics in them, we seem to be entering a period when all adventure games with graphics have to have role playing overtones as well, even if it only says so on the glossy packaging accompanying the game. At least that is one area of game marketing that's improved. The packaging, that is, not deceit on the cover. Mind you, at the prices we are being asked to pay then it jolly well should have improved as well.

But just what do we mean by "role playing overtones"? Everyone who has ever played the tremendous Infocom games Stationfall and Planetfall cannot fail to remember the superb character Floyd. Floyd is a wonderful robot (no graphics needed to conjure up an image of him!), who could easily become a character in a traditional RPG, but just because that is so it does not imply that his status in those two games deserves to give it an RPG rating. To be fair to Infocom they never implied that and never meant to, but other companies might not be so scrupulous when it comes to the advertising.

Another thing to remember is that by playing a straightforward adventure game, your character is learning things. They have to in order to solve the ever-more ingenious puzzles being presented to them. One definition of an RPG might be that your characters learn as the game progresses, so it can readily be seen that even an ordinary adventure could, in some hands, be classified as an RPG. Do not be fooled by these claims, dear reader, we demand more from an RPG than a character simply solving a set of puzzles.

Do characters gain experience by solving these sets of puzzles, or by interacting with other characters who might be roaming about the game world? Well, obviously, to a limited extent they are, but only in the same sort of sense that they are learning. It is not in the true RPG aspect of gaining experience, stamina altering, weaponry and spells available changing, and so on. Another misleading claim that some games could make gets ruled out.

So what are we really looking for? Character interaction is important, but there should be more than just interaction with other goodies/baddies who roam about. Those goodies/baddies should have aims and intentions of their own, those being determined by what class of creature they come under. The good ones should be out to help you, the bad ones out to hinder you. You are going to have to fight some of these creatures at some point, and here we come to one of the main ways of sorting out the RPGs from the adventures.

Adventure fighting usually revolves around the Throw Axe syndrome of Colossal Cave. RPG fighting should depend on what has happened to the player previously and how much they have learnt and remembered of their

cont. on next page

continued from page 77

game world. It should also, in games that require the player to set up a party of 'adventurers', depend on the strengths and weaknesses of those other characters as well. Dimli Gloing, the sturdy drawf, could wield an axe with the best of them but would only product a meaningless mutter if he tried to cast a spell. Strombrigner the Grey, on the other hand, would probably drop the axe but make a fair attempt at using the spell correctly.

It does not matter whether the computer throws up a random selection of characters for you to look after, or whether you choose them yourself, but it is nice to be given the option. The better packages do this, and in some cases the accompanying booklets give you descriptions of all the different sorts of characters that you can choose from. The Phantasie series is particularly good here, and adding the ability to give your chosen heroes whatever names you wish is another bonus. It lends them a far greater personality.

This personality then extends to the fighting sequences which we mentioned just now. Sometimes you really do feel for your characters when they round a corner and find a vicious orc standing there, or a horde of trolls, or whatever. In the better battle sequences you can choose what to do: thrust or parry, use a sword or an axe, cast a fire spell or a sleeping spell, and so on. Unfortunately not all RPGs will let you do this, and you just have to sit and watch while the battle is fought out.

The outcome of the battle should depend on the strength of your character(s), or, to use the popular parlance, the number of hit points that they have managed to gain. I say "should depend", because some programs do not seem to take too much notice of this, and battle away more or less at random. Another thing to look for when examining the packaging and before parting with your cash. That is part of the reason why I think that series of games, or add-ons to an existing game that allow you to use the same character(s), are a good idea. If you like one then the odds are that you will like and buy another one. Companies know this, so really it is up to them to get it right the first time around. If you have enjoyed playing Phantasie I you'll probably buy and enjoy Phantasie II.

And it works the other way around as well. If you did not enjoy playing Battle of the Ninja Dragaon Slavers I you probably will not go out and buy Battle of the Ninja Dragon Slayers II. Please don't write in and tell me that there is a game of that name! I hope there is not.

This business of "hit points" would seem to vary quite a lot as well. Most RPGs feature it in one way or another, perhaps not always using that phrase to describe it. It is intended to give you some idea of how well your character is faring in the game, or characters of course if there is more than one, and tells you roughly how they will fare in combat sequences and how much longer they can persevere before falling down and dying from sheer exhaustion. How annoying to note that one of your loyal band is in danger of extinction, you rush round to the nearest apothecary losing vital hit points in your rush to rescue your character, and then you find that the blessed thing is closed and you have not got a healing potion to hand! Taking note of the number of hit points possessed by all of them should ensure that this sort of situation never happens, although there is always the chance that a combat sequence will take up more than its fair share of hit points and leave one of your characters dangerously weak and close to death.

Thus the character status should be displayed on screen at all times, or at least available at the press of a key so that you can see how they are all getting on. Sometimes I wonder whether hit points should be extended to real life as well. After a marathon pool match I think I would be down to about minus ten. I will let you know after our next game.

Whatever your hit points, you will more than likely have to solve a problem or two along the way, even if it is only of the "staying alive" variety rather than working out where the key to the red door might be hidden, although this type of problem can also often be found. Dungeon Master is a good case in point here.

But some type of problems we could well do without. I recall one game that I looked at for about 15 minutes and have never even considered looking at again, so I had better not name it. Basically you had to move a heroine around the screen in a kind of forest area, although she started off next to a beach. By clicking a mouse after moving a little arrow to the right part of the screen she would walk towards it. Wonderful stuff, nice (if slow) graphics. Off we trotted, found a horse that ran away, but on pursuing the horse I found an ancient swimming pool, all Greek columns and everything. Splash! In we dove for a little swim, frightening the odd nymph as we did so. Time to get out, click on the mouse. But, we could not get out because there are only steps at one end. Retreating to the steps, we climbed out, but we could not do anything because the screen had been entered at such a point that there was no room to squeeze around the columns to left and right. Going back into the swimming pool meant that we could not get out of it again except where we had entered.

I can see the idea of the game, but it could do with being looked at again by its designers. This is because it added something else to the RPG genre, moving graphics and a chance for proper exploration of the game world. But, it had not been implemented properly (in my humble opinion) and introduced all sorts of problems that this kind of game could well do without. One the other hand, it was an attempt to add variety to the RPG world, which is where we came in I believe.

It took many years for adventure games to progress from their humble beginnings, an interesting enough story in its own right but one which we have not the space to cover here in any great detail. We started with the simple "VERB ... NOUN quest for treasures to be collected" variety, moved on to adding graphics and improving the parser, changing the plots so that the player was not basically performing the same sort of story each time (detectives, science fiction, dare I menton The Hobbit), added characters other than the main hero to increase the enjoyment of bedevilment of playing the games, until we end up where we are today with such games as the Cinemaware type like the already classic Defender of the Crown. There is much more to come. Arcade adventures do not really come into it, since they are merely arcade games with many different screens for the most part (nothing wrong with playing them, I'm not getting into that argument!) and do not fit into the history of the adventure game per se.

The point I am trying to make here is that I hope RPG designers take this history into account, and do not take as long to move away from the games that started coming out last year in such great abundance. Much as I admire games like Alternate Reality, there is a limit to the number of times I want to explore a city and build my strength up by visiting various people, performing certain tasks like getting a job, and beating up nasties. I liked it the first time, but let's hope that changes are made to the add-ons and that RPGs as a whole manage to move forward into newer areas. Time will tell, I suppose. Bye for now.

P.G.

CHARDEF +

+4

J. Mathews

We begin our power-packed series with a program from J. Mathews, who has written a very nice character definer program for the +4. Use the cursor (Up/Down) and space bar to select the mode, and the joystick in port 1 to move the drawing cursor (+) around the grid. To fill a square, press fire and move away. Hit the space bar to exit. To edit, use the cursor (Up/Down) and space bar to selct the line to edit. Then use the cursor (Left/Right) and Return to insert spaces. Press the space bar and repeat for solids. The space bar will exit the program.

In addition, the view command allows you to view the UDG graphic you have created; the code command gives you the codes to poke in for the UDGs; and Exit, exits the program. Well done, J. Mathews, well done.

```
10 KEY 1,"POKE65298,196:POKE65299,208"+CHR$(13)
20 LET A=0:LET B=0:LET C=0:LET D=0:LET E=0:LET F=0:LET G=0:LET H=0
30 TRAP 910
40 POKE 51,0:POKE 52,60:POKE 55,0:POKE 56,60:CLR:REM CHARDEF
50 POKE 1177,62:REM COPY CHAR SET
60 FORL=0TO1023
70 POKE15360+L,PEEK(53248+L)
80 NEXT L
90 POKE1177,63:REM SET UP FOR UDGS
100 POKE65299,60
110 POKE65298,192
120 FOR CH=15360 TO 15367
130 READ GH:POKE CH,GH
140 NEXT CH
150 FOR CH=15448 TO 15455
160 READ GH:POKE CH,GH
170 NEXT CH
180 FOR CH=15496 TO 15503
190 READ GH:POKE CH,GH
200 NEXT CH
210 GOTO 250
220 DATA 255,129,129,129,129,129,129,255
230 DATA 255,255,255,255,255,255,255,255
240 DATA 24,24,24,24,24,153,90,60
250 SCNCLR
260 COLOR 0,1:COLOR 1,2:CHAR 1,17,1,"CHARDEF[SP2]BY J.MATTHEWS"
270 CHAR 1,17,2,"──────[SP2]── ──────────"
280 CHAR 1,2,5,"D":CHAR 1,5,5,"DRAW"
290 CHAR 1,2,7,"E":CHAR 1,5,7,"EDIT"
300 CHAR 1,2,9,"V":CHAR 1,5,9,"VIEW"
```

```
310 CHAR 1,2,11,"C":CHAR 1,5,11,"CODE"
320 CHAR 1,2,13,"X":CHAR 1,5,13,"EXIT"
330 CHAR 1,10,14,"ABCDEFGH"
340 CHAR 1,9,15,"1"
350 CHAR 1,9,16,"2"
360 CHAR 1,9,17,"3"
370 CHAR 1,9,18,"4"
380 CHAR 1,9,19,"5"
390 CHAR 1,9,20,"6"
400 CHAR 1,9,21,"7"
410 CHAR 1,9,22,"8"
420 GOSUB 430:GOTO 600
430 CHAR 1,10,15,"@@@@@@@@"
440 LET A1=0:LET A2=0:LET A3=0:LET A4=0:LET A5=0:LET A6=0:LET A7=0:LET A8=0
450 CHAR 1,10,16,"@@@@@@@@"
460 LET B1=0:LET B2=0:LET B3=0:LET B4=0:LET B5=0:LET B6=0:LET B7=0:LET B8=0
470 CHAR 1,10,17,"@@@@@@@@"
480 LET C1=0:LET C2=0:LET C3=0:LET C4=0:LET C5=0:LET C6=0:LET C7=0:LET C8=0
490 CHAR 1,10,18,"@@@@@@@@"
500 LET D1=0:LET D2=0:LET D3=0:LET D4=0:LET D5=0:LET D6=0:LET D7=0:LET D8=0
510 CHAR 1,10,19,"@@@@@@@@"
520 LET E1=0:LET E2=0:LET E3=0:LET E4=0:LET E5=0:LET E6=0:LET E7=0:LET E8=0
530 CHAR 1,10,20,"@@@@@@@@"
540 LET F1=0:LET F2=0:LET F3=0:LET F4=0:LET F5=0:LET F6=0:LET F7=0:LET F8=0
550 CHAR 1,10,21,"@@@@@@@@"
560 LET G1=0:LET G2=0:LET G3=0:LET G4=0:LET G5=0:LET G6=0:LET G7=0:LET G8=0
570 CHAR 1,10,22,"@@@@@@@@"
580 LET H1=0:LET H2=0:LET H3=0:LET H4=0:LET H5=0:LET H6=0:LET H7=0:LET H8=0
590 RETURN
600 LET Y=6
610 CHAR 1,2,Y,"↑"
620 GET A$:IF A$<>CHR$(145) AND A$<>CHR$(17) THEN GOTO 680
630 IF A$=CHR$(145) AND Y=6 THEN GOTO 620
640 IF A$=CHR$(17) AND Y=14 THEN GOTO 620
650 IF A$=CHR$(145)THEN LET Y=Y-2:CHAR 1,2,Y+2," "
660 IF A$=CHR$(17)THEN LET Y=Y+2:CHAR 1,2,Y-2," "
670 GOTO 610
680 IF A$<>" " THEN GOTO 620
690 IF Y=6 THEN GOSUB 760:REM DRAW
700 IF Y=8 THEN GOSUB 1940:REM EDIT
710 IF Y=10 THEN GOSUB 4290:REM VIEW
720 IF Y=12 THEN GOSUB 3290:REM CODE
730 IF Y=14 THEN GOTO 750
740 GOTO 620
750 SCNCLR:POKE65298,196:POKE65299,208:END
760 LET X=10:LET Y=15
770 GOSUB 430:GOSUB 4470
780 CHAR 1,X,Y,"+"
790 GET A$:IF A$=" " THEN GOSUB 4530:GOTO 600
800 J=JOY(1)
810 IF J=7 OR J=135 THEN GOTO 870
820 IF J=3 OR J=131 THEN GOTO 930
830 IF J=1 OR J=129 THEN GOTO 970
840 IF J=5 OR J=133 THEN GOTO 1010
850 IF J=128 THEN GOTO 1050
860 GOSUB 2350:GOTO 790
870 IF X=<10 THEN GOTO 790
880 LET X=X-1:CHAR 1,X+1,Y,"@":GOSUB 2350:IF J=135 THEN GOTO 900
890 GOTO 780
900 LET X=X+1:GOSUB 1060:LET X=X-1:GOTO 780
910 SCNCLR:POKE65298,196:POKE65299,208
920 HELP:PRINT ERR$(ER):END
930 IF X=>17 THEN GOTO 790
```

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```
940 LET X=X+1:CHAR 1,X-1,Y,"@":GOSUB 2350:IF J=131 THEN GOTO 960
950 GOTO 780
960 LET X=X-1:GOSUB 1060:LET X=X+1:GOTO 780
970 IF Y=<15 THEN GOTO 790
980 LET Y=Y-1:CHAR 1,X,Y+1,"@":GOSUB 2350:IF J=129 THEN GOTO 1000
990 GOTO 780
1000 LET Y=Y+1:GOSUB 1060:LET Y=Y-1:GOTO 780
1010 IF Y=>22 THEN GOTO 790
1020 LET Y=Y+1:CHAR 1,X,Y-1,"@":GOSUB 2350:IF J=133 THEN GOTO 1040
1030 GOTO 780
1040 LET Y=Y-1:GOSUB 1060:LET Y=Y+1:GOTO 780
1050 CHAR 1,X,Y,"K":GOSUB 1060:GOTO 780
1060 IF X=11 THEN GOTO 1230
1070 IF X=12 THEN GOTO 1330
1080 IF X=13 THEN GOTO 1430
1090 IF X=14 THEN GOTO 1530
1100 IF X=15 THEN GOTO 1630
1110 IF X=16 THEN GOTO 1730
1120 IF X=17 THEN GOTO 1830
1130 IF Y=15 THEN LET A1=1
1140 IF Y=16 THEN LET A2=1
1150 IF Y=17 THEN LET A3=1
1160 IF Y=18 THEN LET A4=1
1170 IF Y=19 THEN LET A5=1
1180 IF Y=20 THEN LET A6=1
1190 IF Y=21 THEN LET A7=1
1200 IF Y=22 THEN LET A8=1
1210 GOTO 1910
1220 REM X=11
1230 IF Y=15 THEN LET B1=1
1240 IF Y=16 THEN LET B2=1
1250 IF Y=17 THEN LET B3=1
1260 IF Y=18 THEN LET B4=1
1270 IF Y=19 THEN LET B5=1
1280 IF Y=20 THEN LET B6=1
1290 IF Y=21 THEN LET B7=1
1300 IF Y=22 THEN LET B8=1
1310 GOTO 1910
1320 REM X=12
1330 IF Y=15 THEN LET C1=1
1340 IF Y=16 THEN LET C2=1
1350 IF Y=17 THEN LET C3=1
1360 IF Y=18 THEN LET C4=1
1370 IF Y=19 THEN LET C5=1
1380 IF Y=20 THEN LET C6=1
1390 IF Y=21 THEN LET C7=1
1400 IF Y=22 THEN LET C8=1
1410 GOTO 1910
1420 REM X=13
1430 IF Y=15 THEN LET D1=1
1440 IF Y=16 THEN LET D2=1
1450 IF Y=17 THEN LET D3=1
1460 IF Y=18 THEN LET D4=1
1470 IF Y=19 THEN LET D5=1
1480 IF Y=20 THEN LET D6=1
1490 IF Y=21 THEN LET D7=1
1500 IF Y=22 THEN LET D8=1
1510 GOTO 1910
1520 REM X=14
1530 IF Y=15 THEN LET E1=1
1540 IF Y=16 THEN LET E2=1
1550 IF Y=17 THEN LET E3=1
1560 IF Y=18 THEN LET E4=1
1570 IF Y=19 THEN LET E5=1
1580 IF Y=20 THEN LET E6=1
1590 IF Y=21 THEN LET E7=1
1600 IF Y=22 THEN LET E8=1
1610 GOTO 1910
1620 REM X=15
1630 IF Y=15 THEN LET F1=1
1640 IF Y=16 THEN LET F2=1
1650 IF Y=17 THEN LET F3=1
1660 IF Y=18 THEN LET F4=1
1670 IF Y=19 THEN LET F5=1
1680 IF Y=20 THEN LET F6=1
1690 IF Y=21 THEN LET F7=1
1700 IF Y=22 THEN LET F8=1
1710 GOTO 1910
1720 REM X=16
1730 IF Y=15 THEN LET G1=1
1740 IF Y=16 THEN LET G2=1
1750 IF Y=17 THEN LET G3=1
1760 IF Y=18 THEN LET G4=1
1770 IF Y=19 THEN LET G5=1
1780 IF Y=20 THEN LET G6=1
1790 IF Y=21 THEN LET G7=1
1800 IF Y=22 THEN LET G8=1
1810 GOTO 1910
1820 REM X=17
1830 IF Y=15 THEN LET H1=1
1840 IF Y=16 THEN LET H2=1
1850 IF Y=17 THEN LET H3=1
1860 IF Y=18 THEN LET H4=1
1870 IF Y=19 THEN LET H5=1
1880 IF Y=20 THEN LET H6=1
1890 IF Y=21 THEN LET H7=1
1900 IF Y=22 THEN LET H8=1
1910 CHAR 1,X,Y,"K":RETURN
1920 REM END OF VARIABLE ASSIGNING
1930 GOTO 610
1940 REM EDIT
1950 GOSUB 4590
1960 CHAR 1,15,24,"EDIT[SP2]MODE"
1970 CHAR 1,25,15,"WHICH LINE?"
1980 LET Y=15
1990 CHAR 1,19,Y,"←"
```

```
2000 GET A$:IF A$<>CHR$(145) AND A$<>CHR$(17) THEN GOTO 2060
2010 IF A$=CHR$(145) AND Y=15 THEN GOTO 2000
2020 IF A$=CHR$(17) AND Y=22 THEN GOTO 2000
2030 IF A$=CHR$(145)THEN LET Y=Y-1:CHAR 1,19,Y+1," "
2040 IF A$=CHR$(17) THEN LET Y=Y+1:CHAR 1,19,Y-1," "
2050 GOTO 1990
2060 IF A$<>" "THEN GOTO 2000
2070 GOSUB 4620:LET X=10:CHAR 1,25,15,"[SP11]"
2080 CHAR 1,12,12,"*SPACES*"
2090 CHAR 1,8,Y,"♦"
2100 CHAR 1,19,Y,"♦"
2110 CHAR 1,X,13,"Q"
2120 GET A$:IF A$<>CHR$(157) AND A$<>CHR$(29) THEN GOTO 2180
2130 IF A$=CHR$(157) AND X=10 THEN GOTO 2120
2140 IF A$=CHR$(29) AND X=17 THEN GOTO 2120
2150 IF A$=CHR$(157)THEN LET X=X-1:CHAR 1,X+1,13," "
2160 IF A$=CHR$(29)THEN LET X=X+1:CHAR 1,X-1,13," "
2170 GOTO 2110
2180 IF A$<>CHR$(13) THEN GOTO 2210
2190 CHAR 1,X,Y,"@"
2200 GOSUB 2350:GOTO 2110
2210 IF A$<>" "THEN GOTO 2120
2220 CHAR 1,12,12,"*SOLIDS*"
2230 CHAR 1,X,13,"Q"
2240 GET A$:IF A$<>CHR$(157) AND A$<>CHR$(29) THEN GOTO 2300
2250 IF A$=CHR$(157) AND X=10 THEN GOTO 2240
2260 IF A$=CHR$(29) AND X=17 THEN GOTO 2240
2270 IF A$=CHR$(157)THEN LET X=X-1:CHAR 1,X+1,13," "
2280 IF A$=CHR$(29)THEN LET X=X+1:CHAR 1,X-1,13," "
2290 GOTO 2230
2300 IF A$<>CHR$(13) THEN GOTO 2330
2310 CHAR 1,X,Y,"K":GOSUB 1060
2320 GOSUB 1060:GOTO 2240
2330 IF A$<>" "THEN GOTO 2240
2340 GOTO 3220
2350 IF X=11 THEN GOTO 2520
2360 IF X=12 THEN GOTO 2620
2370 IF X=13 THEN GOTO 2720
2380 IF X=14 THEN GOTO 2820
2390 IF X=15 THEN GOTO 2920
2400 IF X=16 THEN GOTO 3020
2410 IF X=17 THEN GOTO 3120
2420 IF Y=15 THEN LET A1=0
2430 IF Y=16 THEN LET A2=0
2440 IF Y=17 THEN LET A3=0
2450 IF Y=18 THEN LET A4=0
2460 IF Y=19 THEN LET A5=0
2470 IF Y=20 THEN LET A6=0
2480 IF Y=21 THEN LET A7=0
2490 IF Y=22 THEN LET A8=0
2500 RETURN
2510 REM X=11
2520 IF Y=15 THEN LET B1=0
2530 IF Y=16 THEN LET B2=0
2540 IF Y=17 THEN LET B3=0
2550 IF Y=18 THEN LET B4=0
2560 IF Y=19 THEN LET B5=0
2570 IF Y=20 THEN LET B6=0
2580 IF Y=21 THEN LET B7=0
2590 IF Y=22 THEN LET B8=0
2600 RETURN
2610 REM X=12
2620 IF Y=15 THEN LET C1=0
2630 IF Y=16 THEN LET C2=0
2640 IF Y=17 THEN LET C3=0
2650 IF Y=18 THEN LET C4=0
2660 IF Y=19 THEN LET C5=0
2670 IF Y=20 THEN LET C6=0
2680 IF Y=21 THEN LET C7=0
2690 IF Y=22 THEN LET C8=0
2700 RETURN
2710 REM X=13
2720 IF Y=15 THEN LET D1=0
2730 IF Y=16 THEN LET D2=0
2740 IF Y=17 THEN LET D3=0
2750 IF Y=18 THEN LET D4=0
2760 IF Y=19 THEN LET D5=0
2770 IF Y=20 THEN LET D6=0
2780 IF Y=21 THEN LET D7=0
2790 IF Y=22 THEN LET D8=0
2800 RETURN
2810 REM X=14
2820 IF Y=15 THEN LET E1=0
2830 IF Y=16 THEN LET E2=0
2840 IF Y=17 THEN LET E3=0
2850 IF Y=18 THEN LET E4=0
2860 IF Y=19 THEN LET E5=0
2870 IF Y=20 THEN LET E6=0
2880 IF Y=21 THEN LET E7=0
2890 IF Y=22 THEN LET E8=0
2900 RETURN
```

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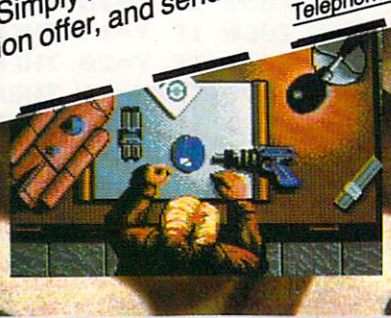

05
0 74470 12127 5

```
2910 REM X=15
2920 IF Y=15 THEN LET F1=0
2930 IF Y=16 THEN LET F2=0
2940 IF Y=17 THEN LET F3=0
2950 IF Y=18 THEN LET F4=0
2960 IF Y=19 THEN LET F5=0
2970 IF Y=20 THEN LET F6=0
2980 IF Y=21 THEN LET F7=0
2990 IF Y=22 THEN LET F8=0
3000 RETURN
3010 REM X=16
3020 IF Y=15 THEN LET G1=0
3030 IF Y=16 THEN LET G2=0
3040 IF Y=17 THEN LET G3=0
3050 IF Y=18 THEN LET G4=0
3060 IF Y=19 THEN LET G5=0
3070 IF Y=20 THEN LET G6=0
3080 IF Y=21 THEN LET G7=0
3090 IF Y=22 THEN LET G8=0
3100 RETURN
3110 REM X=17
3120 IF Y=15 THEN LET H1=0
3130 IF Y=16 THEN LET H2=0
3140 IF Y=17 THEN LET H3=0
3150 IF Y=18 THEN LET H4=0
3160 IF Y=19 THEN LET H5=0
3170 IF Y=20 THEN LET H6=0
3180 IF Y=21 THEN LET H7=0
3190 IF Y=22 THEN LET H8=0
3200 RETURN
3210 REM END OF VARIABLE CHANGE
3220 CHAR 1,15,24,"[SP10]"
3230 CHAR 1,8,Y," "
3240 CHAR 1,19,Y," "
3250 CHAR 1,X,13," "
3260 CHAR 1,12,12,"[SP8]"
3270 GOSUB 4650
3280 LET Y=8:GOTO 610
3290 GOSUB 3310
3300 GOTO 3960
3310 IF A1=1 THEN LET A=A+128
3320 IF B1=1 THEN LET A=A+64
3330 IF C1=1 THEN LET A=A+32
3340 IF D1=1 THEN LET A=A+16
3350 IF E1=1 THEN LET A=A+8
3360 IF F1=1 THEN LET A=A+4
3370 IF G1=1 THEN LET A=A+2
3380 IF H1=1 THEN LET A=A+1
3390 IF A2=1 THEN LET B=B+128
3400 IF B2=1 THEN LET B=B+64
3410 IF C2=1 THEN LET B=B+32
3420 IF D2=1 THEN LET B=B+16
3430 IF E2=1 THEN LET B=B+8
3440 IF F2=1 THEN LET B=B+4
3450 IF G2=1 THEN LET B=B+2
3460 IF H2=1 THEN LET B=B+1
3470 IF A3=1 THEN LET C=C+128
3480 IF B3=1 THEN LET C=C+64
3490 IF C3=1 THEN LET C=C+32
3500 IF D3=1 THEN LET C=C+16
3510 IF E3=1 THEN LET C=C+8
3520 IF F3=1 THEN LET C=C+4
3530 IF G3=1 THEN LET C=C+2
3540 IF H3=1 THEN LET C=C+1
3550 IF A4=1 THEN LET D=D+128
3560 IF B4=1 THEN LET D=D+64
3570 IF C4=1 THEN LET D=D+32
3580 IF D4=1 THEN LET D=D+16
3590 IF E4=1 THEN LET D=D+8
3600 IF F4=1 THEN LET D=D+4
3610 IF G4=1 THEN LET D=D+2
3620 IF H4=1 THEN LET D=D+1
3630 IF A5=1 THEN LET E=E+128
3640 IF B5=1 THEN LET E=E+64
3650 IF C5=1 THEN LET E=E+32
3660 IF D5=1 THEN LET E=E+16
3670 IF E5=1 THEN LET E=E+8
3680 IF F5=1 THEN LET E=E+4
3690 IF G5=1 THEN LET E=E+2
3700 IF H5=1 THEN LET E=E+1
3710 IF A6=1 THEN LET F=F+128
3720 IF B6=1 THEN LET F=F+64
3730 IF C6=1 THEN LET F=F+32
3740 IF D6=1 THEN LET F=F+16
3750 IF E6=1 THEN LET F=F+8
3760 IF F6=1 THEN LET F=F+4
3770 IF G6=1 THEN LET F=F+2
3780 IF H6=1 THEN LET F=F+1
3790 IF A7=1 THEN LET G=G+128
3800 IF B7=1 THEN LET G=G+64
3810 IF C7=1 THEN LET G=G+32
3820 IF D7=1 THEN LET G=G+16
3830 IF E7=1 THEN LET G=G+8
3840 IF F7=1 THEN LET G=G+4
3850 IF G7=1 THEN LET G=G+2
3860 IF H7=1 THEN LET G=G+1
3870 IF A8=1 THEN LET H=H+128
3880 IF B8=1 THEN LET H=H+64
3890 IF C8=1 THEN LET H=H+32
3900 IF D8=1 THEN LET H=H+16
3910 IF E8=1 THEN LET H=H+8
3920 IF F8=1 THEN LET H=H+4
3930 IF G8=1 THEN LET H=H+2
3940 IF H8=1 THEN LET H=H+1
3950 RETURN
3960 CHAR 1,20,15,"="
3970 PRINT A
3980 CHAR 1,20,16,"="
3990 PRINT B
4000 CHAR 1,20,17,"="
4010 PRINT C
4020 CHAR 1,20,18,"="
4030 PRINT D
4040 CHAR 1,20,19,"="
4050 PRINT E
4060 CHAR 1,20,20,"="
4070 PRINT F
4080 CHAR 1,20,21,"="
4090 PRINT G
4100 CHAR 1,20,22,"="
4110 PRINT H
4120 CHAR 1,27,15,"PRESS SPACE"
4130 CHAR 1,27,16,"TO CONTINUE"
4140 GETKEY A$
```

```
4150 IF A$<>" "THEN GOTO 4140
4160 CHAR 1,20,15,"[SP5]"
4170 CHAR 1,20,16,"[SP5]"
4180 CHAR 1,20,17,"[SP5]"
4190 CHAR 1,20,18,"[SP5]"
4200 CHAR 1,20,19,"[SP5]"
4210 CHAR 1,20,20,"[SP5]"
4220 CHAR 1,20,21,"[SP5]"
4230 CHAR 1,20,22,"[SP5]"
4240 CHAR 1,27,15,"[SP11]"
4250 CHAR 1,27,16,"[SP11]"
4260 CHAR 1,15,24,"[SP11]"
4270 LET A=0:LET B=0:LET C=0:LET D=0:LET E=0:LET F=0:LET G=0:LET H=0
4280 LET Y=12:GOTO 610
4290 GOSUB 3310
4300 POKE 15568,A:POKE 15569,B:POKE 15570,C:POKE 15571,D
4310 POKE 15572,E:POKE 15573,F:POKE 15574,G:POKE 15575,H
4320 CHAR 1,20,10,"┌─┐"
4330 CHAR 1,20,11,"|Z|"
4340 CHAR 1,20,12,"└─┘"
4350 CHAR 1,20,13,"UDC"
4360 CHAR 1,25,10,"PRESS SPACE"
4370 CHAR 1,25,11,"TO CONTINUE"
4380 GET A$:IF A$<>" " THEN GOTO 4380
4390 CHAR 1,25,10,"[SP11]"
4400 CHAR 1,25,11,"[SP11]"
4410 CHAR 1,20,10,"[SP3]"
4420 CHAR 1,20,11,"[SP3]"
4430 CHAR 1,20,12,"[SP3]"
4440 CHAR 1,20,13,"[SP3]"
4450 LET A=0:LET B=0:LET C=0:LET D=0:LET E=0:LET F=0:LET G=0:LET H=0
4460 LET Y=10:GOTO 610
4470 CHAR 1,20,15,"USE JOY(1) TO MOVE"
4480 CHAR 1,20,16,"AND FIREBUTTON TO"
4490 CHAR 1,20,17,"FILL IN THE GRID"
4500 CHAR 1,20,18,"PRESS SPACE TO EXIT"
4510 CHAR 1,15,24,"DRAW[SP2]MODE"
4520 RETURN
4530 CHAR 1,20,15,"[SP18]"
4540 CHAR 1,20,16,"[SP18]"
4550 CHAR 1,20,17,"[SP18]"
4560 CHAR 1,20,18,"[SP19]"
4570 CHAR 1,15,24,"[SP10]"
4580 RETURN
4590 CHAR 1,20,8,"SELECT WHICH LINE"
4600 CHAR 1,20,9,"WITH CURSOR UP/DOWN"
4610 RETURN
4620 CHAR 1,15,8,"SELECT WHICH LINE[SP6]"
4630 CHAR 1,15,9,"WITH CURSOR LEFT/RIGHT[SP2]"
4640 RETURN
4650 CHAR 1,15,8,"[SP17]"
4660 CHAR 1,15,9,"[SP22]"
4670 RETURN
```

REBOUND

C64

P.E. Buckland

Andy Eskelson, our programming expert, says this is a real old time great and just about the best breakout clone that he has seen on the C64. "Give Paul an Oscar!!!!"

Instructions. Type in and save the long listing. Run it and answer the tape/disk prompt correctly. This will save the machine code to tape or disk. You can load this code with the loader program, use the one that applied to you (i.e., tape or disk).

```
0 REM LISTING ONE FOR TAPE
10 A=A+1:IF A<>1 THEN SYS 49152
20 POKE 53280,11:POKE 53281,11
30 PRINT CHR$(147)+CHR$(5)
40 LOAD "CODE",8,1


1000 REM PROGRAM TWO
1010 PRINT CHR$(147);"POKING DATA, PLEASE WAIT"
1020 CS=0:LN=1000
1030 FORN=49152TO53240STEP15
1040 FORM=0TO14
1050 READ D:CS=CS+D:POKE N+M,D
1060 NEXT M:READ SU
1070 IF CS<>SU THEN PRINT "ERROR IN LINE "LN:END
1080 LN=LN+10:CS=0
1090 NEXT N
1100 PRINT CHR$(147);"NOW SAVE THE MACHINE CODE"
1110 PRINTCHR$(17);"DO YOU WANT TO SAVE TO TAPE OR DISK T/D"
1120 GET A$:IF A$="" THEN 1120
1130 IF A$="T" THEN DV=1:GOTO 1160
1140 IF A$<>"D" THEN 1120
1150 DV=8
1160 POKE 255,DV
1170 POKE 251,PEEK(43):POKE 252,PEEK(44)
1180 POKE 253,PEEK(45):POKE 254,PEEK(46)
1190 POKE 43,0:POKE 44,192
1200 POKE 45,0:POKE 46,208
1210 SAVE "CODE",PEEK(255),1
1220 POKE 43,PEEK(251):POKE 44,PEEK(252)
1230 POKE 45,PEEK(253):POKE 46,PEEK(254)
1240 PRINT "NOW SAVE THIS PROGRAM":END
1250 DATA 120,173,017,208,041,239,141,017,208,165,001,072,041,251,133,1827
1260 DATA 001,169,208,133,252,169,008,133,254,169,000,133,253,160,000,2042
1270 DATA 132,251,162,002,177,251,073,255,145,253,200,208,247,230,252,2838
1280 DATA 230,254,202,208,240,104,133,001,173,024,208,041,241,009,002,2070
1290 DATA 141,024,208,169,128,141,020,003,169,197,141,021,003,169,170,1704
1300 DATA 141,024,003,169,197,141,025,003,169,133,141,026,208,173,017,1570
1310 DATA 208,041,127,009,128,141,017,208,169,020,141,018,208,169,008,1612
```

```
1320 DATA 141,045,208,162,023,141,005,212,141,012,212,169,000,157,000,1628
1330 DATA 212,202,208,250,169,056,141,001,212,169,007,141,039,208,160,2175
1340 DATA 048,140,249,007,140,251,007,200,140,248,007,140,250,007,200,2034
1350 DATA 140,252,007,140,253,007,140,255,007,200,140,254,007,169,234,2205
1360 DATA 141,001,208,169,238,141,005,208,032,068,229,173,022,208,041,1884
1370 DATA 015,009,016,141,022,208,160,001,140,033,208,140,040,208,140,1481
1380 DATA 037,208,140,006,212,140,013,212,136,140,034,208,140,041,208,1875
1390 DATA 140,042,208,140,038,208,140,016,208,160,010,140,035,208,200,1893
1400 DATA 140,032,208,160,014,140,043,208,140,044,208,140,024,212,169,1882
1410 DATA 240,141,028,208,032,177,201,032,189,201,032,062,200,032,236,2011
1420 DATA 200,173,017,208,009,016,141,017,208,169,224,141,002,220,173,1918
1430 DATA 030,208,088,169,000,141,094,197,032,185,202,032,115,204,169,1866
1440 DATA 009,141,029,201,162,062,160,008,032,240,200,169,007,141,029,1590
1450 DATA 201,169,000,141,116,197,162,255,160,255,173,116,197,208,025,2375
1460 DATA 136,208,248,202,208,243,032,046,200,173,103,197,201,015,208,2420
1470 DATA 003,032,185,202,032,072,202,076,050,193,169,016,044,000,220,1496
1480 DATA 240,249,032,236,200,169,000,141,094,197,032,185,202,169,008,2154
1490 DATA 141,125,197,032,051,200,173,103,197,201,015,208,003,032,185,1863
1500 DATA 202,032,072,202,032,115,204,169,019,141,104,197,169,001,141,1800
1510 DATA 108,197,141,107,197,169,000,141,110,197,141,111,197,141,112,2069
1520 DATA 197,141,116,197,141,106,197,169,136,141,117,197,169,144,141,2309
1530 DATA 095,197,169,120,141,092,197,169,184,141,093,197,169,234,141,2339
1540 DATA 096,197,169,015,141,021,208,162,064,172,104,197,136,208,253,2143
1550 DATA 202,208,247,173,106,197,240,094,169,000,141,110,197,141,111,2336
1560 DATA 197,141,112,197,169,030,141,096,197,141,096,197,032,035,200,1981
1570 DATA 169,005,141,021,208,160,255,140,039,208,162,255,202,208,253,2426
1580 DATA 136,192,006,208,243,206,106,197,206,125,197,208,038,032,115,2215
1590 DATA 204,169,000,141,021,208,032,067,204,160,010,140,029,201,162,1748
1600 DATA 084,136,032,240,200,169,007,141,029,201,162,004,032,097,204,1738
1610 DATA 032,046,200,076,017,193,032,017,197,076,123,193,173,116,197,1688
1620 DATA 240,141,032,027,195,032,225,194,032,011,196,173,100,197,208,2003
1630 DATA 010,173,127,197,208,024,173,126,197,208,019,169,000,141,100,1872
1640 DATA 197,032,035,200,032,046,200,162,002,032,037,204,076,110,193,1558
1650 DATA 173,096,197,201,234,144,017,201,238,176,013,173,095,197,056,2211
1660 DATA 237,117,197,024,105,008,168,016,003,076,186,193,201,033,144,1708
1670 DATA 003,076,186,193,032,128,194,076,186,193,238,109,197,173,119,2103
1680 DATA 197,201,002,240,005,201,003,240,001,096,192,020,176,039,173,1786
1690 DATA 119,197,201,002,208,024,192,008,176,007,169,002,162,014,076,1557
1700 DATA 169,194,169,001,162,019,141,107,197,142,104,197,032,004,196,1834
1710 DATA 169,004,141,119,197,076,030,197,173,119,197,201,003,208,024,1858
1720 DATA 192,032,176,007,169,001,162,019,076,208,194,169,002,162,014,1583
1730 DATA 141,107,197,142,104,197,032,004,196,169,001,141,119,197,076,1823
1740 DATA 030,197,173,092,197,074,074,074,141,005,195,173,093,197,074,1789
1750 DATA 074,074,168,169,004,133,254,169,000,024,105,040,133,253,144,1744
1760 DATA 002,230,254,136,208,244,024,105,000,133,253,144,002,230,254,2219
1770 DATA 096,013,021,208,141,021,208,096,045,021,208,141,021,208,096,1544
1780 DATA 173,119,197,201,001,240,074,201,002,208,003,076,168,195,201,2059
1790 DATA 003,208,003,076,214,195,173,095,197,201,030,240,029,206,095,1965
1800 DATA 197,206,092,197,206,108,197,240,001,096,173,096,197,201,058,2265
1810 DATA 240,016,206,096,197,206,093,197,032,004,196,096,032,004,196,1811
1820 DATA 076,001,197,174,107,197,238,095,197,238,092,197,202,208,247,2466
1830 DATA 032,004,196,076,017,197,173,095,197,201,248,240,029,238,095,2038
1840 DATA 197,238,092,197,206,108,197,240,001,096,173,096,197,201,058,2297
1850 DATA 240,016,206,096,197,206,093,197,032,004,196,096,032,004,196,1811
1860 DATA 076,001,197,174,107,197,206,095,197,206,092,197,202,208,247,2402
1870 DATA 032,004,196,076,017,197,173,095,197,201,248,240,029,238,095,2038
1880 DATA 197,238,092,197,206,108,197,240,001,096,173,096,197,201,241,2480
1890 DATA 176,016,238,096,197,238,093,197,032,004,196,096,032,004,196,1811
1900 DATA 076,001,197,238,106,197,096,173,095,197,201,030,240,029,206,2082
1910 DATA 095,197,206,092,197,206,108,197,240,001,096,173,096,197,201,2302
1920 DATA 241,176,016,238,096,197,238,093,197,032,004,196,096,032,004,1856
1930 DATA 196,076,001,197,238,106,197,096,173,107,197,141,108,197,096,2126
1940 DATA 160,040,032,044,196,240,004,032,001,197,096,160,001,032,044,1279
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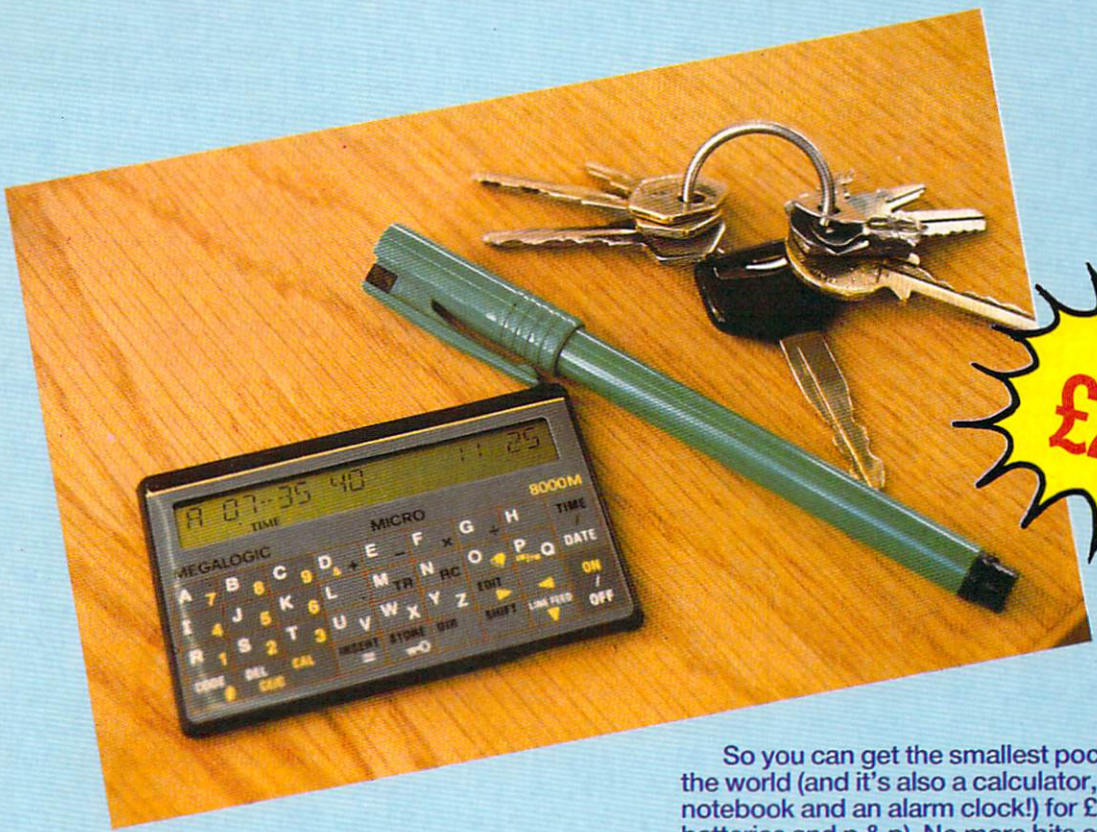

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```
1950 DATA 196,240,004,032,241,196,096,160,000,032,044,196,240,003,032,1712
1960 DATA 241,196,096,177,253,201,072,208,014,032,130,196,032,181,196,2225
1970 DATA 076,080,196,160,000,076,065,200,201,073,208,009,032,130,196,1702
1980 DATA 032,181,196,076,093,196,169,000,096,173,097,197,032,105,196,1839
1990 DATA 200,173,098,197,076,105,196,173,098,197,032,105,196,136,048,2030
2000 DATA 048,173,097,197,145,253,173,099,197,072,165,253,141,127,196,2336
2010 DATA 165,254,041,003,009,216,141,128,196,104,153,000,216,096,165,1887
2020 DATA 253,141,145,196,165,254,041,003,009,216,141,146,196,185,000,2091
2030 DATA 216,041,015,096,200,165,253,072,165,254,072,165,253,056,233,2256
2040 DATA 001,133,253,176,002,198,254,173,097,197,032,105,196,104,133,2054
2050 DATA 254,104,133,253,096,162,001,142,108,197,201,010,176,020,024,1881
2060 DATA 105,001,141,099,197,169,072,141,097,197,169,073,141,098,197,1897
2070 DATA 032,233,203,096,169,010,141,099,197,169,064,141,097,197,141,1989
2080 DATA 098,197,173,126,197,056,233,001,141,126,197,176,003,206,127,2057
2090 DATA 197,032,233,203,096,238,109,197,172,119,197,136,185,080,197,2391
2100 DATA 141,119,197,076,030,197,238,109,197,172,119,197,136,185,084,2197
2110 DATA 197,141,119,197,076,030,197,238,109,197,172,119,197,136,185,2310
2120 DATA 088,197,141,119,197,172,119,197,136,185,068,197,141,012,196,2165
2130 DATA 185,072,197,141,023,196,185,076,197,141,034,196,096,162,017,1918
2140 DATA 142,004,212,202,142,004,212,162,255,202,208,253,096,041,001,2136
2150 DATA 000,040,000,040,041,001,001,041,040,000,002,001,004,003,004,0218
2160 DATA 003,002,001,002,001,004,003,120,184,000,144,234,064,064,010,0836
2170 DATA 000,000,000,000,019,073,000,001,000,000,000,000,000,000,010,0103
2180 DATA 020,000,136,000,004,028,000,000,200,000,000,000,000,173,025,0586
2190 DATA 208,141,025,208,141,195,204,041,004,208,030,173,195,204,041,2018
2200 DATA 001,208,029,173,109,197,240,009,206,109,197,032,053,197,032,1792
2210 DATA 053,197,173,013,220,104,168,104,170,104,064,032,147,198,076,1823
2220 DATA 165,197,032,046,199,032,008,200,173,095,197,141,002,208,024,1719
2230 DATA 105,004,141,006,208,173,096,197,141,003,208,024,105,004,141,1556
2240 DATA 007,208,173,117,197,141,000,208,024,105,004,141,004,208,173,1710
2250 DATA 113,197,141,008,208,173,110,197,141,009,208,173,114,197,141,2130
2260 DATA 010,208,173,111,197,141,011,208,173,115,197,141,014,208,173,2080
2270 DATA 112,197,141,015,208,173,124,197,141,013,208,173,123,197,141,2163
2280 DATA 012,208,173,121,197,208,003,076,031,198,173,121,197,056,233,2007
2290 DATA 001,141,121,197,076,165,197,032,042,198,169,007,141,039,208,1734
2300 DATA 076,165,197,169,016,044,000,220,208,003,032,141,198,169,004,1642
2310 DATA 044,000,220,208,003,076,073,198,169,008,044,000,220,208,003,1474
2320 DATA 076,107,198,096,174,117,197,224,038,176,001,096,160,006,202,1868
2330 DATA 136,208,252,142,117,197,173,116,197,208,011,160,006,206,095,2224
2340 DATA 197,206,092,197,136,208,247,096,174,117,197,224,226,144,001,2462
2350 DATA 096,160,006,232,136,208,252,142,117,197,173,116,197,208,233,2473
2360 DATA 160,006,238,095,197,238,092,197,136,208,247,096,169,001,141,2221
2370 DATA 116,197,096,173,030,208,141,101,197,041,065,201,065,240,105,1976
2380 DATA 173,101,197,041,017,201,017,240,118,173,101,197,041,033,201,1851
2390 DATA 033,240,109,173,101,197,041,129,201,129,240,100,173,116,197,2179
2400 DATA 240,027,173,101,197,041,018,201,018,240,019,173,101,197,041,1787
2410 DATA 130,201,130,240,023,173,101,197,041,034,201,034,240,027,096,1868
2420 DATA 169,000,141,110,197,169,239,032,020,195,076,255,198,169,000,1970
2430 DATA 141,112,197,169,127,032,020,195,076,255,198,169,000,141,111,1943
2440 DATA 197,169,223,032,020,195,032,241,196,162,003,032,037,204,096,1839
2450 DATA 173,102,197,201,015,240,009,238,125,197,032,115,204,076,035,1959
2460 DATA 200,238,100,197,076,035,200,173,121,197,208,010,169,030,141,2095
2470 DATA 121,197,169,015,141,039,208,096,173,110,197,208,029,032,225,1960
2480 DATA 199,224,248,208,040,173,117,197,024,105,008,162,058,142,110,2015
2490 DATA 197,141,113,197,169,016,032,013,195,032,239,199,238,110,197,2088
2500 DATA 238,110,197,173,110,197,201,245,144,005,169,000,141,110,197,2237
2510 DATA 173,111,197,208,026,032,225,199,224,248,208,040,032,213,199,2335
2520 DATA 169,058,141,111,197,142,114,197,169,032,032,013,195,032,239,1841
2530 DATA 199,238,111,197,238,111,197,238,111,197,173,111,197,201,245,2764
2540 DATA 144,005,169,000,141,111,197,173,112,197,208,026,032,225,199,1939
2550 DATA 224,248,208,050,032,213,199,169,058,141,112,197,142,115,197,2305
2560 DATA 169,128,032,013,195,032,239,199,032,225,199,224,150,176,006,2019
2570 DATA 238,115,197,076,197,199,206,115,197,238,112,197,173,112,197,2569
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2580 DATA 201,245,144,005,169,000,141,112,197,096,032,225,199,224,240,2230
2590 DATA 176,249,224,030,144,245,096,169,129,141,018,212,169,255,141,2398
2600 DATA 015,212,174,027,212,096,169,016,141,012,212,169,004,141,013,1613
2610 DATA 212,169,120,141,008,212,162,129,142,011,212,202,142,011,212,2085
2620 DATA 096,173,122,197,208,001,096,169,064,032,013,195,238,124,197,1925
2630 DATA 173,102,197,141,045,208,173,124,197,201,248,208,010,169,191,2387
2640 DATA 032,020,195,169,000,141,122,197,096,169,021,141,128,200,160,1791
2650 DATA 000,032,065,200,169,024,141,128,200,096,172,112,200,185,113,1837
2660 DATA 200,141,227,200,185,128,200,141,232,200,185,188,200,141,217,2785
2670 DATA 200,185,173,200,141,215,200,185,143,200,141,206,200,185,158,2732
2680 DATA 200,141,204,200,152,072,032,203,200,104,168,136,016,210,096,2134
2690 DATA 014,029,039,029,001,030,001,030,031,040,039,039,031,040,031,0424
2700 DATA 040,025,017,002,025,025,001,001,024,024,001,025,001,001,025,0237
2710 DATA 025,001,031,001,000,029,000,029,030,039,031,031,030,039,030,0346
2720 DATA 039,001,001,000,001,001,000,000,001,001,000,024,000,000,024,0093
2730 DATA 024,010,002,014,014,014,014,014,011,011,011,011,011,011,011,0183
2740 DATA 011,064,065,066,067,067,068,069,067,067,066,066,068,069,070,0950
2750 DATA 071,162,000,160,000,032,012,229,138,072,152,072,162,000,169,1431
2760 DATA 000,032,028,234,104,168,104,170,200,192,000,208,233,232,224,2129
2770 DATA 000,208,226,096,160,000,162,000,185,051,201,141,034,201,141,1806
2780 DATA 048,201,185,061,201,141,035,201,185,071,201,141,046,201,152,2070
2790 DATA 072.160,000,189,081,201,201,042,240,008,032,033,201,232,200,1892
2800 DATA 076,009,201,232,104,168,200,192,008,208,208,096,153,000,004,1859
2810 DATA 173,035,201,024,105,212,141,049,201,169,000,153,000,216,096,1775
2820 DATA 111,193,015,096,175,215,159,040,117,193,004,004,005,005,005,1337
2830 DATA 005,006,006,007,005,006,002,006,002,006,006,006,002,000,000,0065
2840 DATA 032,012,005,022,005,012,032,032,042,048,048,042,032,019,003,0386
2850 DATA 015,018,005,032,032,042,048,048,048,048,048,048,042,032,008,0514
2860 DATA 009,007,008,032,032,032,042,032,019,003,015,018,005,032,032,0318
2870 DATA 042,032,012,009,022,005,019,032,032,042,048,048,048,048,048,0487
2880 DATA 048,042,032,016,018,005,019,019,032,006,009,018,005,032,020,0321
2890 DATA 015,032,019,020,001,018,020,032,042,032,007,001,013,005,032,0289
2900 DATA 015,022,005,018,032,042,162,096,189,232,201,157,000,010,202,1383
2910 DATA 016,247,096,162,000,160,000,185,195,204,201,000,208,022,200,1896
2920 DATA 152,072,185,195,204,168,169,000,157,000,012,232,136,208,249,2139
2930 DATA 104,168,202,076,225,201,157,000,012,200,232,192,125,208,218,2320
2940 DATA 096,254,254,170,254,254,254,170,254,255,255,255,255,255,255,3490
2950 DATA 255,255,000,000,255,255,255,255,085,085,061,061,061,061,061,2005
2960 DATA 061,061,061,000,000,063,063,063,063,061,061,000,001,253,253,1064
2970 DATA 253,253,125,061,061,060,063,063,063,063,021,085,061,061,253,1546
2980 DATA 253,253,253,085,085,000,063,063,063,063,063,063,085,000,253,1645
2990 DATA 253,253,253,253,253,085,000,061,061,061,061,061,061,085,000,1801
3000 DATA 061,061,061,061,061,061,085,169,028,141,120,197,160,000,140,1406
3010 DATA 126,197,140,127,197,177,251,141,030,203,141,035,203,169,004,2141
3020 DATA 141,031,203,169,216,141,036,203,200,152,072,177,251,240,021,2253
3030 DATA 141,028,203,201,001,208,006,032,085,203,076,134,202,032,236,1788
3040 DATA 202,104,168,076,103,202,078,126,197,173,094,197,208,008,014,1950
3050 DATA 126,197,144,003,046,127,197,104,168,200,152,024,101,251,133,1973
3060 DATA 251,144,002,230,252,238,103,197,162,001,189,193,004,201,057,2224
3070 DATA 240,004,254,193,004,096,169,048,157,193,004,202,016,237,096,1913
3080 DATA 169,063,133,251,169,205,133,252,169,000,141,103,197,141,122,2248
3090 DATA 197,169,048,141,193,004,141,194,004,173,094,197,201,001,208,1965
3100 DATA 006,206,094,197,076,213,203,238,094,197,169,032,141,083,196,2145
3110 DATA 141,096,196,076,177,201,072,041,240,074,074,074,170,104,041,1777
3120 DATA 015,141,033,203,160,000,173,033,203,240,003,238,126,197,173,1938
3130 DATA 105,197,073,001,141,105,197,032,019,203,200,202,208,233,096,2012
3140 DATA 141,028,203,173,033,203,240,010,169,000,141,001,004,169,015,1530
3150 DATA 141,001,216,032,064,203,206,120,197,208,018,169,028,141,120,1864
3160 DATA 197,169,012,141,069,203,032,064,203,169,001,141,069,203,096,1769
3170 DATA 173,030,203,024,105,001,141,030,203,141,035,203,144,006,238,1677
3180 DATA 031,203,238,036,203,096,169,000,141,126,197,141,127,197,169,2074
3190 DATA 004,141,152,203,141,179,203,169,041,141,151,203,141,178,203,2250
3200 DATA 169,255,141,154,203,032,141,203,169,216,141,152,203,141,179,2499
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3210 DATA 203,169,041,141,151,203,141,178,203,169,015,141,154,203,076,2188
3220 DATA 141,203,169,019,141,118,197,162,014,160,013,185,041,004,041,1608
3230 DATA 255,201,072,144,018,073,001,072,173,126,197,024,105,001,141,1603
3240 DATA 126,197,144,003,238,127,197,104,157,041,004,232,136,016,222,1944
3250 DATA 206,118,197,208,001,096,173,151,203,024,105,040,141,151,203,2017
3260 DATA 141,178,203,144,006,238,152,203,238,179,203,076,146,203,169,2479
3270 DATA 004,141,083,196,141,096,196,162,016,189,056,202,157,064,010,1713
3280 DATA 202,016,247,096,173,122,197,208,053,032,225,199,224,253,240,2487
3290 DATA 011,224,003,240,007,224,123,240,003,076,035,204,238,122,197,1947
3300 DATA 173,095,197,141,123,197,173,096,197,141,124,197,032,225,199,2310
3310 DATA 224,148,144,008,169,015,141,102,197,076,035,204,169,013,141,1786
3320 DATA 102,197,162,004,189,096,005,201,057,240,004,254,096,005,096,1708
3330 DATA 169,048,157,096,005,202,016,237,162,004,169,057,157,040,006,1525
3340 DATA 202,016,250,096,162,000,189,096,005,221,040,006,208,006,232,1729
3350 DATA 224,005,208,243,096,144,253,162,004,189,096,005,157,040,006,1832
3360 DATA 202,016,247,096,138,072,162,255,160,255,136,208,253,202,208,2610
3370 DATA 248,104,170,202,016,239,096,172,125,197,192,010,176,062,185,2194
3380 DATA 185,204,141,143,204,169,199,141,159,204,169,218,141,160,204,2641
3390 DATA 162,007,160,000,185,144,009,162,007,074,072,176,005,169,007,1339
3400 DATA 076,158,204,169,002,157,199,218,104,202,016,238,173,159,204,2279
3410 DATA 024,105,040,141,159,204,144,003,238,160,204,200,192,007,208,2029
3420 DATA 214,096,128,136,144,152,160,168,176,184,192,200,060,000,002,2012
3430 DATA 126,000,002,255,000,002,255,000,002,255,000,002,255,000,002,1156
3440 DATA 126,000,002,060,000,066,063,255,252,127,255,254,255,255,255,2225
3450 DATA 127,255,254,000,031,036,000,002,024,000,002,039,000,002,027,0799
3460 DATA 000,002,039,000,002,015,000,002,015,000,042,085,084,000,001,0287
3470 DATA 106,168,000,001,106,168,000,002,104,000,002,104,000,002,104,0867
3480 DATA 000,001,005,168,000,001,006,168,000,001,006,168,000,001,006,0531
3490 DATA 128,000,001,006,128,000,001,006,128,000,001,006,128,000,001,0534
3500 DATA 006,128,000,004,005,064,000,001,006,128,000,001,006,128,000,0477
3510 DATA 010,161,233,239,238,237,236,235,234,238,237,000,161,031,208,2698
3520 DATA 046,192,061,176,076,160,091,144,106,128,125,112,140,096,159,1812
3530 DATA 080,174,064,189,048,204,032,235,000,161,096,047,176,078,144,1728
3540 DATA 109,112,140,080,171,048,074,024,025,112,094,024,030,128,074,1245
3550 DATA 024,025,144,171,080,140,112,109,144,078,176,047,001,081,176,1508
3560 DATA 029,064,031,064,029,032,029,016,029,032,063,032,029,016,045,0540
3570 DATA 080,063,080,026,029,064,063,080,026,016,029,064,031,096,026,0773
3580 DATA 032,029,160,026,208,026,208,026,144,063,016,026,112,111,026,1213
3590 DATA 096,175,048,239,239,239,223,000,121,032,077,160,077,160,078,1964
3600 DATA 160,078,160,079,160,079,160,078,160,078,160,076,160,076,160,1824
3610 DATA 074,160,074,160,079,160,073,160,072,001,081,048,030,224,030,1426
3620 DATA 208,030,208,030,192,142,096,142,080,046,047,046,128,174,048,1617
3630 DATA 206,032,206,032,030,016,030,176,030,016,030,176,030,016,030,1056
3640 DATA 176,030,016,030,176,030,016,046,160,030,016,046,160,001,121,1054
3650 DATA 235,235,240,024,176,240,238,238,240,040,160,240,239,239,240,3024
3660 DATA 056,001,081,016,026,016,026,016,026,144,027,016,027,016,027,0521
3670 DATA 144,028,016,028,016,028,144,030,016,030,016,030,144,029,016,0715
3680 DATA 029,016,029,144,031,016,031,016,031,144,026,016,026,016,026,0597
3690 DATA 144,028,016,028,016,028,144,030,016,030,016,030,144,027,016,0713
3700 DATA 027,016,027,128,224,224,224,233,233,001,041,096,047,160,111,1792
3710 DATA 112,143,096,063,046,063,080,063,062,079,064,063,046,027,079,1086
3720 DATA 048,079,046,027,095,032,079,046,027,079,048,175,064,159,080,1084
3730 DATA 175,064,191,048,207,048,175,064,175,080,143,096,143,112,111,1832
3740 DATA 160,047,000,041,096,040,096,106,040,111,107,040,110,108,040,1142
3750 DATA 205,040,108,110,040,107,111,040,106,105,040,105,096,040,192,1445
3760 DATA 040,192,040,192,040,192,040,192,040,192,040,096,072,032,040,1440
3770 DATA 032,072,000,041,031,031,030,027,026,030,128,030,031,031,030,0570
3780 DATA 027,026,030,112,026,030,031,031,030,027,026,112,027,026,030,0591
3790 DATA 031,031,030,027,112,030,027,026,030,031,031,030,128,030,027,0621
3800 DATA 026,030,031,031,208,031,240,240,240,240,048,104,128,104,128,1829
3810 DATA 104,128,104,128,104,001,041,096,031,176,063,160,079,160,031,1406
3820 DATA 024,047,144,031,056,031,144,031,056,031,128,047,056,031,128,0985
3830 DATA 063,024,047,128,111,128,111,128,047,024,063,128,047,024,063,1136
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3840 DATA 144,047,024,047,144,063,040,160,079,160,079,176,063,208,031,1465
3850 DATA 001,121,032,088,144,024,073,144,024,025,062,144,024,025,030,0961
3860 DATA 042,144,024,025,030,026,031,144,024,025,030,026,031,144,024,0770
3870 DATA 025,030,026,031,144,024,025,030,026,031,144,024,025,030,042,0657
3880 DATA 144,024,025,062,144,024,073,144,088,001,041,092,047,112,092,1113
3890 DATA 047,112,092,047,112,028,078,047,112,028,078,047,112,028,078,1046
3900 DATA 040,112,027,046,042,040,112,027,046,042,040,112,027,046,074,0833
3910 DATA 112,027,046,074,112,027,046,074,112,027,040,074,112,027,047,0957
3920 DATA 074,112,027,047,074,112,029,079,041,112,029,079,041,112,029,0997
3930 DATA 079,041,112,001,041,024,032,079,128,024,032,062,144,024,032,0855
3940 DATA 047,160,024,032,030,176,024,144,031,064,024,128,046,064,024,1018
3950 DATA 112,063,048,024,112,078,032,024,112,078,032,024,112,063,048,0962
3960 DATA 024,112,046,064,024,112,031,064,024,192,024,192,024,192,024,1149
3970 DATA 048,025,128,024,048,025,026,112,024,048,025,026,176,025,026,0786
3980 DATA 001,000,000,000,000,000,000,000,000,000,000,000,000,000,000,0001
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HARDCOPY

C64/128

Neil Humpfreys

This program is a somewhat slow hi-res screen dump, but it is all in BASIC and shows how a short program can achieve good results. It also works in C128 mode and produces a good print that is not compressed in one direction. This is done by rotating the screen dump by 90 degrees before printing.

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10 CLOSE4:OPEN4,4:FORL=0TO336STEP56
20 FORN=0TO56STEP8:PRINT#4,CHR$(8);D$:D$="":IF8504-N-L<8192THEN200
30 ON(N/64-INT(N/64))*8+1GOTO40,60,80,100,120,140,160,180
40 FORT=8504-N-LTO16184-N-LSTEP320:FORP=0TO7
50 D$=D$+CHR$(PEEK(T+P)OR128):NEXTP,T,N
60 FORT=8504-N-LTO16184-N-LSTEP320:FORP=0TO7
70 D$=D$+CHR$((PEEK(T+P)AND63)*2+(PEEK(T+P+8)AND128)/128+128):NEXTP,T,N
80 FORT=8504-N-LTO16184-N-LSTEP320:FORP=0TO7
90 D$=D$+CHR$((PEEK(T+P)AND31)*4+(PEEK(T+P+8)AND192)/64+128):NEXTP,T,N
100 FORT=8504-N-LTO16184-N-LSTEP320:FORP=0TO7
110 D$=D$+CHR$((PEEK(T+P)AND15)*8+(PEEK(T+P+8)AND224)/32+128):NEXTP,T,N
120 FORT=8504-N-LTO16184-N-LSTEP320:FORP=0TO7
130 D$=D$+CHR$((PEEK(T+P)AND7)*16+(PEEK(T+P+8)AND240)/16+128):NEXTP,T,N
140 FORT=8504-N-LTO16184-N-LSTEP320:FORP=0TO7
150 D$=D$+CHR$((PEEK(T+P)AND3)*32+(PEEK(T+P+8)AND248)/8+128):NEXTP,T,N
160 FORT=8504-N-LTO16184-N-LSTEP320:FORP=0TO7
170 D$=D$+CHR$((PEEK(T+P)AND1)*64+(PEEK(T+P+8)AND252)/4+128):NEXTP,T,N
180 FORT=8504-N-LTO16184-N-LSTEP320:FORP=0TO7
190 D$=D$+CHR$((PEEK(T+P+8)AND254)/2+128):NEXTP,T,N,L
200 FORX=8192TO15872STEP320:FORZ=0TO7
210 PRINT#4,G$;CHR$((PEEK(X+Z)AND128)/128+128);:NEXTZ,X:PRINT#4:CLOSE4
```

TRACE

C64

P.E. Buckland

Trace is a short and sweet utility that TRACEs the operation of a program, allowing you to see where it goes, (just the job for Bug thumping).

!TE will turn the trace on (direct or program mode).

!TD will turn off the trace.

The CBM key will pause the program, and the control key will slow the program down. To change the color of the trace line POKE 53059,0-15 (color code).

```
PIKI 0 REM ** CBM 64 TRACE BY PAUL E BUCKLAND
EALE 10 PRINT CHR$(147);"STORING DATA, PLEASE WAIT"
GFHH 20 CS=0:LN=1000
LMFP 30 FOR N = 52927 TO 53239 STEP 8
MBOI 40 FOR M = 0 TO 7
EFAM 50 READ D:CS=CS+D:POKE N+M,D
GFAK 60 NEXT M:READ SU
HILN 70 IF CS <> SU THEN PRINT "ERROR IN LINE "LN:END
MALH 80 LN=LN+10: CS=0
EIKD 90 NEXT N
HOMD 100 SYS 53079
DMBF 110 NEW
NNLO 1000 DATA 165,157,240,003,108,008,003,166,0850
DHME 1009 DATA 057,165,058,197,252,208,010,228,1175
KIKG 1018 DATA 251,208,006,032,066,207,108,008,0886
DLDJ 1027 DATA 003,134,251,134,099,133,252,133,1139
BJDO 1036 DATA 098,162,144,056,032,073,188,032,0785
MJOP 1045 DATA 223,189,162,005,189,000,001,157,0926
FGDH 1054 DATA 244,207,202,016,247,162,005,169,1252
MONJ 1063 DATA 032,157,034,004,202,016,250,032,0727
JONI 1072 DATA 066,207,165,254,208,035,173,141,1249
KDCA 1081 DATA 002,201,004,208,003,032,165,207,0822
FIGM 1090 DATA 201,002,240,007,201,006,240,003,0900
EDEE 1099 DATA 108,008,003,173,141,002,201,000,0636
IALN 1108 DATA 208,249,169,001,133,254,108,008,1130
PHCG 1117 DATA 003,032,225,255,240,014,173,141,1083
OGJD 1126 DATA 002,201,004,240,007,201,002,208,0865
JBCI 1135 DATA 240,076,026,207,169,000,133,254,1105
HKHI 1144 DATA 108,008,003,160,001,162,000,189,0631
NEHM 1153 DATA 244,207,240,011,157,035,004,152,1050
JDIE 1162 DATA 157,035,216,232,076,070,207,096,1089
HENG 1171 DATA 169,160,133,254,169,000,133,253,1271
ECLI 1180 DATA 162,032,177,253,145,253,200,208,1430
```

Program Submission Procedure

DO NOT submit any program or routine that you do not either own or have authority to do so.

ALWAYS include your name, address and date on all material sent.

NEVER use staples, use paperclips if necessary.

If you are using TAPE save the program at least TWICE on each side. DO NOT USE TURBO SAVE SYSTEMS.

If you are using DISK save the program at least twice and call the second program BACKUP.

IDENTIFY your tape/disk with: your name and address, the program name and WHAT COMPUTER it is for.

PLEASE do not submit hand-written work, unless it is unavoidable. *** Note *** you can always write your instructions in the form of a computer program, eg 1 PRINT 'your text' etc.

INCLUDE a short statement of what your program is supposed to do.

IF YOU USE A WORDPROCESSOR supply a standard ASCII file of the article, this allows us to load it into our standard wordprocessors.

INCLUDE the following STANDARD header on all programs. Even if your program is in multiple parts, include this information on each part
(this will be stripped off prior to publication).

NAME ....
ADDRESS
ADDRESS
ADDRESS
POSTCODE
COUNTRY
TELEPHONE No. (if poss).
COMPUTER
DOS/ROM TYPE
PROGRAM NAME

ALWAYS ensure that disks are well packed, Use a commercial disk mailer or at least packed between two pieces of thick cardboard or rigid plastic.

MARK the package MAGNETIC MEDIA DO NOT BEND OR EXPOSE TO MAGNETIC FIELDS in BOLD letters on BOTH sides.

Please allow at least 8 weeks for acknowledgement as all programs have to be thoroughly tested and put into a suitable format.

Enclose a self-addressed stamped envelope or package if you would like your program to be returned.

Overseas submissions can use IRC's International Reply Coupons.

* Programming Tips *

If you can, use CHR$(x) type commands instead of graphic characters.

Renumber your program in a standard form, most readers use auto number utilities to ease typing in.

Try to keep instructions within the program fairly short. You can expand on them within the text if necessary

TEST YOUR PROGRAMS..better still get a friend to test them for you.

IF YOUR PROGRAM CONTAINS MACHINE CODE:
Please use DECIMAL data statements, NOT HEX for the BASIC loader. Keep the same number of data statements on each line (MAX 14) and use the three digit format if possible. eg 000,010,243,001 etc.

```
EDKH 1189 DATA 249,230,254,202,208,244,169,076,1632
DLAA 1198 DATA 141,225,167,169,191,141,226,167,1427
EPBP 1207 DATA 169,206,141,227,167,169,176,141,1396
CNDN 1216 DATA 008,003,169,207,141,009,003,169,0709
HFMN 1225 DATA 000,133,254,169,076,141,186,167,1126
EJIK 1234 DATA 169,154,141,187,167,169,207,141,1335
IGBB 1243 DATA 188,167,096,133,061,132,062,169,1008
NLFN 1252 DATA 000,133,157,076,190,167,162,255,1140
GBNC 1261 DATA 160,255,136,208,253,202,208,248,1670
KDLF 1270 DATA 096,032,115,000,201,033,240,003,0720
CKBH 1279 DATA 076,231,167,032,115,000,201,084,0906
DHEH 1288 DATA 240,003,076,008,175,032,115,000,0649
AHCG 1297 DATA 201,069,240,007,201,068,240,023,1049
EOCO 1306 DATA 076,008,175,120,165,001,041,254,0840
MFMM 1315 DATA 133,001,088,169,000,133,252,133,0909
KBIL 1324 DATA 251,032,115,000,076,174,167,120,0935
MHJL 1333 DATA 165,001,009,001,133,001,088,032,0430
BAKC 1342 DATA 115,000,076,174,167,000,000,000,0532
MJBJ 1351 DATA 000,000,000,000,000,000,000,000,0000
S-ENTRY CODE = EAFF
```

CLASSIFIED

I need contacts all over the world for swapping programs for the C64 and Amiga. 100% return guaranteed. Please write to M. Hansen, Austhagen 5, 4300 Sandnes, Norway.

Wanted – Amiga contacts, write to: Toni Tanska, Einonpolku 6, 45740 KSNK, Finland. 100% reply.

C64 user wishes to have U.K. or European pen pals. He is 21 years of age and is currently studying astronomy. Any age, male or female, all letters will be answered...Write to:– Sasha Novacic... Flat 3/17-19 Tullock St., Deer Park, Melbourne, Vic, Australia.

Amiga contacts wanted to exchange games, demos, tips, etc. For instant reply write to: Striker, 4 Park Grove, Bexleyheath, Kent, DA7 6AA.

For Sale: HARDWARE – Commodore 128K ram model 710B with 80 column green monitor. Commodore printer model MPP 1361 (136 column) Dual disc drive 8250 LP. SOFTWARE – Pegasus accounting suite, Superscript II, Superbase, Calc Result. Asking price £500. Tel 0633-612044.

We want heaps of penpals to swap M/L routines, Demos, Utilities and Games. Send letters/discs proptly to: A.D.D., c/-Elizabeth Fields P/O, South Australia, 5113. No lamers please.

C64 owner wants to swap software all over the world. Disk only. Write to Fredrik Nilsson, Gokv 7 Asenhoga S-33500 GNOSJO, Sweden.

For sale – +4, Tape Deck, £100 worth of games, Joystick, £65. Also Spectrum 48K, £20 worth of games £45. Bargain! Phone Hassocks 6189 'Toby'.

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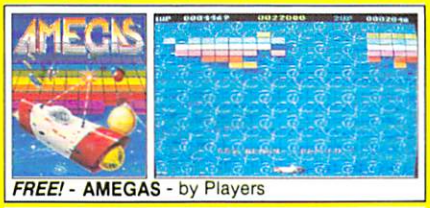

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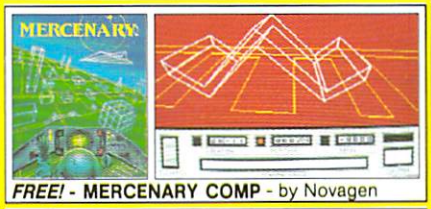

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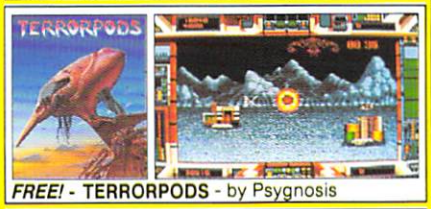

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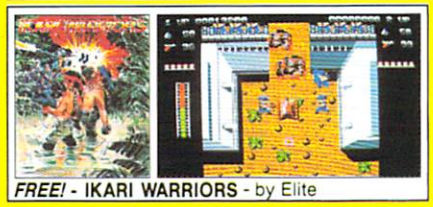

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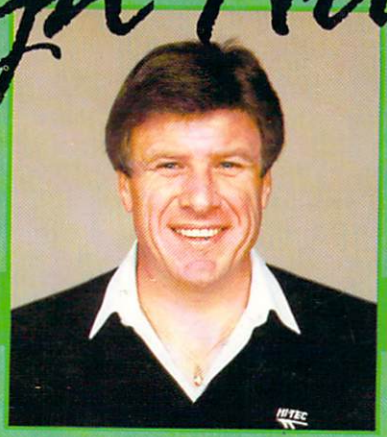

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